

HILLMAN

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(79) 229 final.

Brussels, 7 May 1979

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Proposal for a
COUNCIL DIRECTIVE (EEC)
on the approximation of the laws of the Member States relating
to powered industrial trucks

(submitted to the Council by the Commission)

COM(79) 229 final.

EXPLANATORY MEMORANDUM

I. INTRODUCTION

1. The Community market in powered industrial trucks, lifting and mechanical handling appliances is considerable, and both the range of applications and the number of different models are rapidly increasing. In 1977 annual production of powered industrial trucks in the Community exceeded 98,000 units (out of a total of 110,000 units for Western Europe as a whole), representing a value of approximately 710 million ECU.

The Community, accounting as it does for one-third of world production, is now the largest producer, immediately followed by the United States and Japan.

2. The sector embraces 150 Community producers, whose workforce at present numbers 35,000. Of every 10 trucks manufactured in the Community 4 are sold in another Member State and 4 in third countries. In 1977 exports accounted for some 339 million EUA and imports by the Community in the same year amounted to 126 million EUA.

The principal countries of destination are: EFTA, the other countries of Western Europe and as to about one-third of the production, the Arab countries, particularly those which are members of OPEC.

3. This is consequently a sector in which the balance of trade is still very favourable despite very keen competition on the world market. In comparison with previous years, a slight decline in production can be noted. In terms of intra-Community trade, the position is deteriorating.

The new measures that were taken by one Member State on 2 June 1978 and have been in force since 2 December 1978 merely add considerably to the technical barriers to trade which had already been noted during a comparative examination of the laws, regulations and administrative provisions in force in the Member States in this sector.

This examination made it possible to appreciate the important differences that exist in the technical requirements and the testing procedures in force, particularly in regard to safety provisions for these handling appliances.

4. This situation compels manufacturers of powered industrial trucks to adapt their production and their stocks of spares and equipment to the varying technical requirements laid down by the laws of the Member States for which these appliances are intended. Furthermore, it appears that certain Member States, for example the one referred to above, are also preparing amendments to their laws in this field.
5. Although, at present only one Member State operates a prior administrative procedure - such as type-approval or type-examination - in respect of the marketing of these products, the mode of operation and the scope of the tests and examinations to which manufacturers must submit their trucks often differ widely.
6. The national laws appear, however, to be justified to the extent that Member States are responsible for protecting users of powered industrial trucks, in particular workers and third parties. Consequently, approximation of the laws seems to be the most suitable means of eliminating the harmful effects of the differences noted.
7. The aim of this Directive is therefore to remove the existing technical barriers to trade by an approximation of the relevant laws. The legal basis for such action is Article 100 of the EEC Treaty.
8. The sector of powered industrial trucks comes within the scope of the proposal for a directive, presented to the Council on 16 July 1975 (1), on the approximation of the laws of the Member States relating to common provisions for lifting and mechanical handling appliances.
9. The Commission has set up a Working Party composed of government experts and representatives of trade associations and European inspection bodies to provide it with advice on technical matters. It has also established the necessary contacts with the Advisory Committee on Safety, Hygiene and Health Protection at Work.

(1) OJ C 222 of 29 September 1975.

II. COMMENTS ON THE PROPOSAL FOR A DIRECTIVE

This proposal for a directive covers virtually the entire sector of powered industrial trucks with a capacity not exceeding 10,000 kg. The approximation of the laws relating to powered industrial trucks of a capacity greater than 10,000 kg will, if necessary, be the subject of a subsequent proposal for a directive. According to professional circles this type of appliance accounts for only 2% of the total market.

EEC independent certification has been selected as the Community procedure for the placing on the market and entry into service of powered industrial trucks.

The competent departments of the Commission felt it advisable in this respect to abide by the opinion of the vast majority of the experts consulted during the meetings of the Working Party and to take account of present-day practice in nearly all the Member States.

Finally, the harmonization method proposed by the Commission is the "optional" method.

The technical annex to the proposal for a directive consists of twelve chapters the first eight of which contain definitions and classifications derived from international standards. In addition, the technical requirements for powered industrial trucks are divided into general requirements, which apply to all types of truck, and special requirements, which apply in particular to trucks with an elevating driving position.

The Commission departments did not wish to preclude from the outset the technical measures recently taken by a Member State relating to the pedal arrangement on trucks (accelerator, service-brake and clutch pedals) and the requirement to use removable fuel tanks only. The purpose of these two requirements is to achieve greater safety, but in order to enable manufacturers to adapt their products to these new requirements a delay of 5 years is envisaged so that the new provisions would not take effect until 1 January 1985.

The tests and examinations for stability, visibility and electrical equipment which are to be carried out by the manufacturer, or possibly by the user, before the placing on the market and/or entry into service of the appliances are at present covered by national and international standards or draft standards. The competent departments of the Commission are of the opinion that, since in this case implementing measures of a technical nature are concerned, it is appropriate to assign to the Commission, the task of institution by way of the Committee procedure.

III. CONSULTATION OF THE EUROPEAN PARLIAMENT AND THE ECONOMIC AND SOCIAL COMMITTEE

Pursuant to the second paragraph of Article 100 of the EEC Treaty, the opinions of these two bodies are required, since the implementation of the provisions contained in this Directive will involve the amendment of legislation in all Member States.

PROPOSAL FOR A COUNCIL DIRECTIVE (EEC)

on the approximation of the laws of the Member States
relating to powered industrial trucks

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,
and in particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the Opinion of the European Parliament,

Having regard to the Opinion of the Economic and Social Committee,

Whereas in each Member State the design and construction of powered industrial trucks are subject to safety provisions which differ from one Member State to another and consequently hinder trade in these appliances; whereas it is therefore necessary to approximate these provisions;

Whereas Council Directive 78/ /EEC of on the approximation of the laws of the Member States relating to common provisions for lifting and mechanical handling appliances⁽¹⁾ laid down a series of common procedures, such as EEC type-approval, EEC type-examination and EEC independent certification, for the placing on the market of these lifting and mechanical handling appliances; whereas, in the case of powered industrial trucks and in accordance with the usual practice in the Member States, EEC independent certification should be provided for;

Whereas this Directive is a separate directive within the meaning of Article 2 (2) of Directive 78/ /EEC;

Whereas the technical provisions contained in Annex I do not preclude Community or national measures concerning other safety aspects of these industrial trucks such as electrical safety (see Council Directive No. 73/23/EEC of 19 February 1973 relating to electrical equipment designed for use between certain voltage limits), exhaust and noise;

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Whereas in the interests of greater safety it appears advisable to introduce provisions relating to pedal arrangement and fuel tank; whereas a transition period is justified in order to enable manufacturers to adapt their products to these new provisions;

Whereas technical progress necessitates rapid adaptation of the technical requirements; whereas the procedure laid down in Article 22 of Directive 78 /EEC should therefore be adopted for such adaptations of this Directive;

Whereas the institution of examination and testing methods is an implementing measure of a technical nature, and whereas it is appropriate that this be adopted by the Commission in accordance with this same procedure;

HAS ADOPTED THIS DIRECTIVE;

Article 1

- . This Directive shall apply to powered industrial trucks.
- . This Directive does not cover:
 - a) tipper vehicles (known as dumpers) or motor-driven barrows, operating on building and construction sites;
 - b) road tractors, lorries, forestry and agricultural tractors, construction plant and trucks used in underground mining operations;
 - c) mobile elevating equipment for construction sites which does not conform to the definition set out in Article 2 (1);
 - d) stacking appliances which move only inside guides and are known as "rack feeders";
 - e) powered industrial trucks of a capacity exceeding 10,000 kg;
 - f) straddle carriers;
 - g) driverless tractors and trucks.

Article 2

- . For the purpose of this Directive "powered industrial truck" means any wheeled vehicle, other than those running on rails, that is designed to carry, tow, push, lift or stack any kind of load and is controlled by an operator who either walks with the truck or rides on a specially arranged driving platform which is either unmovably fixed to the chassis or can be raised.
- . Powered industrial trucks covered by this Directive comprise the following three categories:
 - a) Non-elevating platform trucks
trucks that carry their load on a fixed platform or some other elevating attachment;
 - b) Tractors and pusher trucks
industrial trucks fitted with a towing or pushing device and specially designed to tow or push vehicles travelling on the ground (e.g. trailers, aircraft, etc) or on rails (waggon);

c) Elevating trucks,

low-lift or high-lift trucks, whether or not counterbalanced and with the operator's position either fixed or rising with the load, whether or not stacking in a particular direction, that travel freely on prepared or unprepared ground or between guides which do not increase the truck's stability, and whether fitted with forks or any other attachment;

rough-terrain fork trucks for loading, lifting, carrying and stacking, specially designed to operate on unprepared ground, equipped with a load carrying device that slides vertically on a fixed or tilting mast and having a substantial ground clearance.

3. "EEC truck" means any powered industrial truck which satisfies the requirements of this Directive.

Article 3

1. EEC trucks shall be eligible for EEC independent certification in accordance with Article 2 of Directive 78/ /EEC.
2. In order to be eligible for the said EEC independent certification, EEC trucks must comply with the requirements laid down in Annex I hereto, such compliance being certified by the manufacturer by means of a certificate of conformity, a model of which is shown in Annex II, and be the affixing of the mark of conformity in accordance with the conditions set out in Annex III.

Article 4

No Member State may, on grounds relating to the requirements laid down in this Directive, refuse, prohibit or restrict the placing on the market and the entry into service of EEC trucks which meet the requirements laid down in Annex I. Where such trucks are accompanied by a certificate of conformity and bear the mark of conformity referred to in Article 3 indicating that they comply with the requirements of this Directive, it shall be presumed that they so comply.

Article 5

Member States shall take all necessary measures to ensure that manufacturers or importers issue a certificate of conformity only when the powered industrial trucks referred to in Article 1 satisfy the requirements of this Directive.

Article 6

1. Amendments that are necessary in order to adjust Annex I to technical progress shall be adopted in accordance with the procedure laid down in Article 22 of Directive 78/ /EEC.
2. Test and examination methods that are necessary in order to check the compliance of a powered industrial truck with the requirements of this Directive shall likewise be adopted in accordance with this procedure.

Article 7

1. Member States shall bring into force the laws, regulations and administrative provisions necessary in order to comply with this Directive within eighteen months after its notification. However, they shall bring into force the provisions necessary in order to comply with points 10.5.1.2. and 10.7.1.2.2. of Annex I on 1 January 1985. They shall forthwith inform the Commission thereof.
2. As soon as this Directive has been notified, Member States shall also ensure that the Commission is informed, in sufficient time for it to submit its comments, of any draft laws, regulations or administrative provisions which they intend to adopt in the field covered by this Directive.

Article 8

This Directive is addressed to the Member States.

ANNEX I

TECHNICAL REQUIREMENTS FOR POWERED INDUSTRIAL TRUCKS

Contents

	<u>Page</u>
1. Scope	1
2. Classification of trucks by mode of action	1
3. Classification of trucks by mode of control	3
4. Classification of trucks by height of lift	3
5. Classification of trucks by mode of travelling	4
6. Classification of trucks by power source	4
7. Classification of trucks by types of wheel	5
8. Definition of the main components of trucks	5
9. Capacity of trucks and removable attachments	16
10. General provisions	17
11. Special requirements	41
- trucks with elevating operator and	
- trucks specifically designed to travel with elevated loads.	
12. Documentation - Operating and servicing instructions	48
 Addendum A - Definition of the capacity.	 50
Addendum B - Capacity plate data.	52
Addendum C - Specifications of connectors	54
Addendum D - Valid operating conditions for trucks with elevating operator position and trucks specifically designed to travel with elevated loads.	 59

1. Scope

The scope covers all powered industrial trucks up to and including 10,000 kg capacity.

Excluded are:

- a) tipper vehicles, known as dumpers, or motor driven barrows operating on building and construction sites;
- b) road tractors, lorries, forestry and agricultural tractors, construction plant and trucks used in underground mining operations;
- c) mobile elevating equipment for construction sites which does not conform to the definition set out in the Directive;
- d) stacking appliances which move only inside guides and are known as "rack feeders";
- e) any powered industrial trucks of a capacity exceeding 10,000 kg;
- f) straddle carriers;
- g) driverless tractors and trucks.

2. Classification of trucks by mode of action

2.1. Platform truck

Truck carrying its load on a non elevating platform or attachment.

2.2. Industrial tractor

Industrial truck travelling on the ground fitted with coupling means, and specially designed to draw vehicles travelling on the ground.

2.3. Shunting-tractor

Tractor which being fitted at the front end and/or rear with a buffer plate can also push vehicles travelling on the ground or on railway track.

2.4. Lift-truck

Industrial truck which is capable of raising, lowering and transporting loads.

2.4.1. Stacking lift truck

Truck fitted with a platform, a fork, or other load handling devices, able to raise a load, either palletized or not, up to sufficient lift height to allow stacking or tiering in racks.

2.4.1.1. Counterbalanced lift truck:

stacking lift truck fitted with a fork on which the load either palletized or not, is put in a cantilever position in relation with the frontwheels and balanced by the mass of the truck.

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- 2.4.1.2. Reach truck with retractable mast or fork carriage:
stacking lift-truck with outriggers where the load can be placed in a cantilever position by extending the mast or the fork carriage.
- 2.4.1.3. Straddle truck:
stacking lift-truck with outriggers, fitted with a fork located between the outriggers and where the centre of gravity of the load is always within the stability polygon.
- 2.4.1.4. Pallet staker:
stacking lift-truck where the fork arms extend over the frame structure.
- 2.4.1.5. Platform high lift truck:
stacking lift-truck with a load platform extending over the frame structure.
- 2.4.1.6. Truck with elevated operator:
stacking lift truck, fitted with an operating position which can be raised with the load carrying means (platform or fork) for stacking and retrieving loads in racks.
- 2.4.1.7. Side-loading truck:
fork truck the retractable mast of which is located between the axles and perpendicular to the longitudinal axis of the truck, allowing it to take and raise a load in a counterbalanced position in relation to one side of the truck and to place it on the integral load platform.
- 2.4.1.8. Rough-terrain fork truck:
machine specially designed to load, lift, carry and stack materials and to operate on unprepared ground (large wheels, large ground clearance, special drive unit) fitted with a load carrying device sliding vertically on a fixed or tilting mast.
- 2.4.1.9. Lateral stacking truck:
high lift stacking truck capable of stacking and retrieving loads to one or both sides of the direction of travel.
- 2.4.1.10. Lateral and front stacking truck:
high lift stacking truck capable of stacking and retrieving loads along and to one or both sides of the direction of travel.
- 2.4.1.11. Straddle carriers:
lift truck, where the frame and lift unit straddle the load to raise it, move it, and stack it.
- 2.4.2. Low lift non stacking lift-truck
Powered truck fitted with a platform, fork or other load handling equipment and able to raise its load to a height just sufficient to allow its transportation.
- 2.4.2.1. Pallet truck:
non stacking lift-truck, fitted with a fork for the handling of pallets.

2.4.2.2. Platform floor truck:
non stacking lift-truck fitted with a platform or a chassis for the handling of skids.

2.4.2.3. Straddle carriers:
lift-truck, where the frame and lift unit straddle the load to raise it and move it.

2.4.3. High and medium lift order picking trucks

A truck with an elevatable platform for an operator and a device to accommodate the aggregated load (normally fork arms to accept a pallet or stillage) to facilitate picking (and occasional replacing) from stored goods.

Medium lift designates trucks able to elevate the operator platform not more than 2.5 m.

3. Classification on trucks by mode of control

3.1. Rider controlled

3.1.1. Sit-on : non-elevable operator
- facing forward
- other than facing forward

3.1.2. Sit-on : elevable operator
- facing forward
- other than facing forward

3.1.3. Stand-on : non-elevable operator
- facing forward
- other than facing forward

3.1.4. Stand-on : elevable operator
- facing forward
- other than facing forward

3.2. Pedestrian controlled (1)

3.3. Driverless

3.3.1. Imposed steering

3.3.2. remote controlled

4. Classification of trucks by height of lift

4.1. Non lifting (including platform trucks, industrial tractors and shunting tractors - see 2.1., 2.2., 2.3.).

(1) Some of these trucks may, on occasion, be adapted to carry the driver and as such are covered by the provisions laid down for trucks in the category of those under 3.1.

4.2. Low lift (non stacking trucks) . see 2.4.2.

4.3. High lift trucks

4.3.1. Stacking trucks (see 2.4.1.)

4.3.2. Non stacking (see 2.4.3.)

5. Classification of trucks by mode of travelling

5.1. Free travel truck

5.1.1. Uni-directional truck

Truck able to move in either direction on a line parallel with its longitudinal axis.

5.1.2. Bi-directional truck

Truck able to move in either direction on a line, parallel with its longitudinal axis, or perpendicular to this axis.

5.1.3. Multi-directional truck

Truck able to move in any direction relative to its longitudinal axis.

5.2. Guided travel truck

Truck fitted with special equipment, able to move only in a path defined by external fixed means.

5.3. Dual-purpose, free or guided travel truck

A free travel truck equipped for optional guided travel operation.

6. Classification of trucks by power source

6.1. Internal combustion

6.1.1. Petrol

6.1.2. Liquefield petroleum gas (LPG)

6.1.3. LPG/Petrol

6.1.4. Diesel

6.2. Electric

6.2.1. With storage battery

6.2.2. ICE - Electric

6.2.3. Electric, by an independent power source.

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- 7. Classification of trucks by types of wheel
- 7.1. Wheels with pneumatic tyres
- 7.2. Wheels with pneumatic shaped solid tyres
- 7.3. Wheels with solid tyres
- 7.4. Solid wheels
- 8. Definition of the main components of trucks
- 8.1. Basic components of trucks
- 8.1.1. Chassis and associated components
- 8.1.1.1. Chassis
Main frame structure bearing the various units of the truck:
i.e. engine, transmission, lifting gear, etc. ...
- 8.1.1.2. Counterweights
A counterbalancing mass fixed to the chassis of a counter-
balanced truck at the end opposite to the load bearing means.
- 8.1.1.3. Ballast containers
Containers which, when filled with ballast, act as counter-
weights.
- 8.1.1.4. Additional ballast
Additional ballast fitted to the chassis of a lift-truck and
intended to maintain the original stability.
- 8.1.1.5. Bodywork
Protective or styling panels fitted to the chassis.
- 8.1.1.6. Driving position
Place for the operator and the driving controls of the truck
and, where appropriate, load handling controls.
- 8.1.1.7. Stabilisers
Movable components generally in pairs, normally actuated by
hydraulic or mechanical means, for ensuring or increasing the
stability of the truck during load handling operations (see
8.1.4.1.5.).
- 8.1.2. Axles
- 8.1.2.1. Drive (including differential)
- 8.1.2.2. Steer
- 8.1.2.3. Drive-steer
- 8.1.2.4. Load

8.1.3. Driving and steering unit

Driving unit rotating on the vertical axis, fitted with a single or dual wheel, used for driving and steering the truck.

8.1.4. Wheels

8.1.4.1. Function of wheels

8.1.4.1.1. Drive wheel

8.1.4.1.2. Steer wheel

8.1.4.1.3. Steer and drive wheel

8.1.4.1.4. Load wheel

8.1.4.1.5. Stabiliser wheels

Auxiliary wheels or castors, solidly or resiliently mounted to the chassis of an industrial truck, usually in pairs, to assist in maintaining stability when the truck is subjected to disturbing forces.

8.1.4.2. Arrangement of wheels

8.1.4.2.1. Number of wheels at any mounting

8.1.4.2.1.1. Single (1)

8.1.4.2.1.2. Twin (2)

8.1.4.2.1.3. Multiple (more than 2)

8.1.4.2.2. Mounting of wheels

8.1.4.2.2.1. Counterlever mounting

8.1.4.2.2.2. Fork mounting

8.1.4.3. Construction of wheels

8.1.4.3.1. Wheel made from only one material (monobloc, e.g.: metal, plastic, rubber)

8.1.4.3.2. Bonded tyred wheel

8.1.4.3.3. Pressed-on tyred wheel

8.1.4.3.4. Split rim for removable solid tyres - flat based

8.1.4.3.5. Split rim for removable solid tyres - conical based

8.1.4.3.6. Wheels for pneumatic or pneumatic shaped solid tyres

8.1.4.4. Suspension mountings

8.1.4.4.1. Articulated

8.1.4.4.2. Springloaded

8.1.4.4.3. Bogie

8.1.4.4.4. Tandem

8.1.5. Prime mover

8.1.5.1. Electric motor

8.1.5.2. Internal combustion engine

8.1.5.2.1. Petrol

8.1.5.2.2. Liquefied petroleum gas (LPG)

- 8.1.5.2.3. Petrol/LPG
- 8.1.5.2.4. Diesel
- 8.1.6. Transmission systems (from prime mover)
- 8.1.6.1. Hydraulic
- 8.1.6.1.1. Hydrokinetic
 - A system in which the prime mover torque is transmitted by an hydraulic impeller and turbine.
- 8.1.6.1.2. Hydrostatic
 - A system in which torque from the power unit is transmitted by means of a positive displacement hydraulic pump and motor.
- 8.1.6.2. Mechanical
 - A system in which the prime mover torque is transmitted by means of a friction clutch and gear (chain, belt) system or directly through a gear (chain, belt) system.
- 8.1.6.3. Electric
 - A system in which the prime mover torque is transmitted by means of an electrical generator and motor.
- 8.1.7. Electrical equipment
- 8.1.7.1. Electric trucks
- 8.1.7.1.1. Traction battery
- 8.1.7.1.2. Charging set (built in or not)
- 8.1.7.1.3. Control devices, controllers, contactors, resistances, electronic control systems
- 8.1.7.1.4. Accessories (connectors, wires, etc. ..)
- 8.1.7.2. Engine powered trucks
- 8.1.7.2.1. Starter battery
- 8.1.7.2.2. Charging equipment (dynamo, alternator)
- 8.1.7.2.3. Starter motor
- 8.1.7.3. Ancillary electrical equipment
- 8.1.7.3.1. Lighting
- 8.1.7.3.1.1. Driving-lights (regulation lights)
- 8.1.7.3.1.2. Working lights
- 8.1.7.3.2. Recording (ampere hour, time-recorder) and indicating (fuel, temperature, etc. ..)
- 8.1.8. Supply system for IC Engine
- 8.1.8.1. Petrol
- 8.1.8.1.1. Carburettor
- 8.1.8.2. Supply system for LPG
- 8.1.8.2.1. Removable container
- 8.1.8.2.2. Fixed container with filling valve
- 8.1.8.2.3. Pressure reducer
- 8.1.8.2.4. Gas-air mixer (vaporizer)

- 8.1.8.2.5. Valve
- 8.1.8.2.6. Safety-valve
- 8.1.8.2.7. Piping
- 8.1.8.3. Diesel
- 8.1.8.3.1. Fuel injection
- 8.1.9. Steering system
- 8.1.9.1. Manual
- 8.1.9.1.1. Automotive type wheel
- 8.1.9.1.2. Steering by lever
- 8.1.9.1.3. Steering by tiller
- 8.1.9.1.4. Steering by oscillating platform
- 8.1.9.2. Power assisted
- 8.1.9.2.1. Hydraulic
- 8.1.9.2.2. Pneumatic
- 8.1.9.2.3. Electric
- 8.1.9.3. Power steering
- 8.1.10. Braking system
- 8.1.10.1. Types of brakes
- 8.1.10.1.1. Service brakes
- 8.1.10.1.2. Parking brakes
- 8.1.10.2. Types of control
- 8.1.10.2.1. Mechanical
- 8.1.10.2.2. Hydraulic
- 8.1.10.2.3. Electric
- 8.1.10.2.4. Pneumatic
- 8.1.10.2.5. Power assisted
- 8.1.11. Load bearing attachments
- 8.1.11.1. Fork arms
- 8.1.11.1.1. Fork arms hook mounted
- 8.1.11.1.2. Fork arms shaft mounted
- 8.1.11.1.3. Fork arms bolted
- 8.1.11.1.4. Fork arm extension
- 8.1.11.2. Load platform
- 8.1.11.2.1. Fixed
- 8.1.11.2.2. Lifting
- 8.1.11.2.3. Tipping body
- 8.1.11.3. Other attachments

- 8.1.11.3.1. Types of attachments
 - 8.1.11.3.1.1. Fixed - in relation to the fork carrier (crane-arm, boom, etc. ..) or in relation to the chassis (container, tank, etc. ..)
 - 8.1.11.3.1.2. Load bearing attachment or part movable in relation to fork carrier (fork truck) or in relation to chassis (other trucks)
 - 8.1.11.3.1.2.1. Mechanical (drop bottom container or scoop)
 - 8.1.11.3.1.2.2. Hydraulic (clamp attachment, side-shift, rotating head, etc. ..)
 - 8.1.11.3.1.2.3. Pneumatic (vacuum, etc. ..)
 - 8.1.11.3.1.2.4. Electric (electro-magnet)
 - 8.1.11.3.2. Modes of action of equipment
 - 8.1.11.3.2.1. Simple clamping device for engaging the load (e.g. stabilizer, squeeze, clamp, attachment)
 - 8.1.11.3.2.2. Simple equipment for engaging and imparting movement to the load (e.g. side shift, push-pull, rotating head)
 - 8.1.11.3.2.3. Multiple equipment (e.g. rotating clamp)
- 8.1.12. Components associated with movements of the load (excluding travel)
 - 8.1.12.1. Common components
 - 8.1.12.1.1. Motor or engine
 - 8.1.12.1.2. Pump, control valve, piping and accessories
 - 8.1.12.2. Lifting assembly (or mast) composed of:
 - a fixed upright in which the fork arm carriage or one or several moving uprights slide
 - and
 - one or more lifting jacks lifting either through chains or wire-ropes or directly on the fork arm carriage (or load platform) and the moving upright(s)
 - 8.1.12.2.1. Upright(s) (fixed or moving):
Frame structure composed of structural sections generally in pairs and linked by cross-members
 - 8.1.12.2.2. Lifting jack(s)
 - simple lifting jack : jack with single rams used for the elevation of the load
 - compound lifting jack : jack having several concentric rams elevating one after the other or simultaneously
 - 8.1.12.2.3. Other lifting mechanisms (e.g.: winches, screws)
 - 8.1.12.2.4. Lifting chains:
 - roller chains
 - leaf chains
 - 8.1.12.2.4.1. Lifting cables

- 8.1.12.2.5. Fork arm carriage : component sliding along a mast and bearing the load carrying means
- 8.1.12.3. Other components
 - 8.1.12.3.1. Tilting system (e.g. tilting jack(s))
 - 8.1.12.3.2. Reach system
 - 8.1.12.3.3. Lifting systems other than masts (e.g. cranes)
 - linkage-lift mechanism
 - lifting mechanisms for low-lift trucks
- 8.1.12.4. Mast (classification by arrangement of uprights)
 - 8.1.12.4.1. Non-telescopic mast (simple mast)
Mast composed only of a fixed upright
 - 8.1.12.4.2. Telescopic mast : mast having one fixed upright and one or more moving uprights
 - 8.1.12.4.2.1. Double mast (simple telescopic mast) : mast having one fixed upright and one moving upright
 - 8.1.12.4.2.2. Triple mast : mast having one fixed upright and two moving uprights
 - 8.1.12.4.2.3. Quadruple mast : mast having one fixed upright and three moving uprights

8.2. Truck data

8.2.1. Unladen service mass

Mass of complete truck with its accessories and ready for use, i.e.

- filled fuel tank for ICE trucks
 - traction battery for electric storage battery trucks
- The truck being unladen and without driver.

8.2.2. Shipping weight mass

Mass of truck with its accessories and ready for use but with no source of energy on the truck i.e., without fuel or traction battery.

The truck being unladen and without driver.

Notes:

The words "without fuel" should be understood as follows:

- for petrol, diesel or LPG trucks with a permanently installed container with the empty container
- for LPG trucks with removable container: without container.

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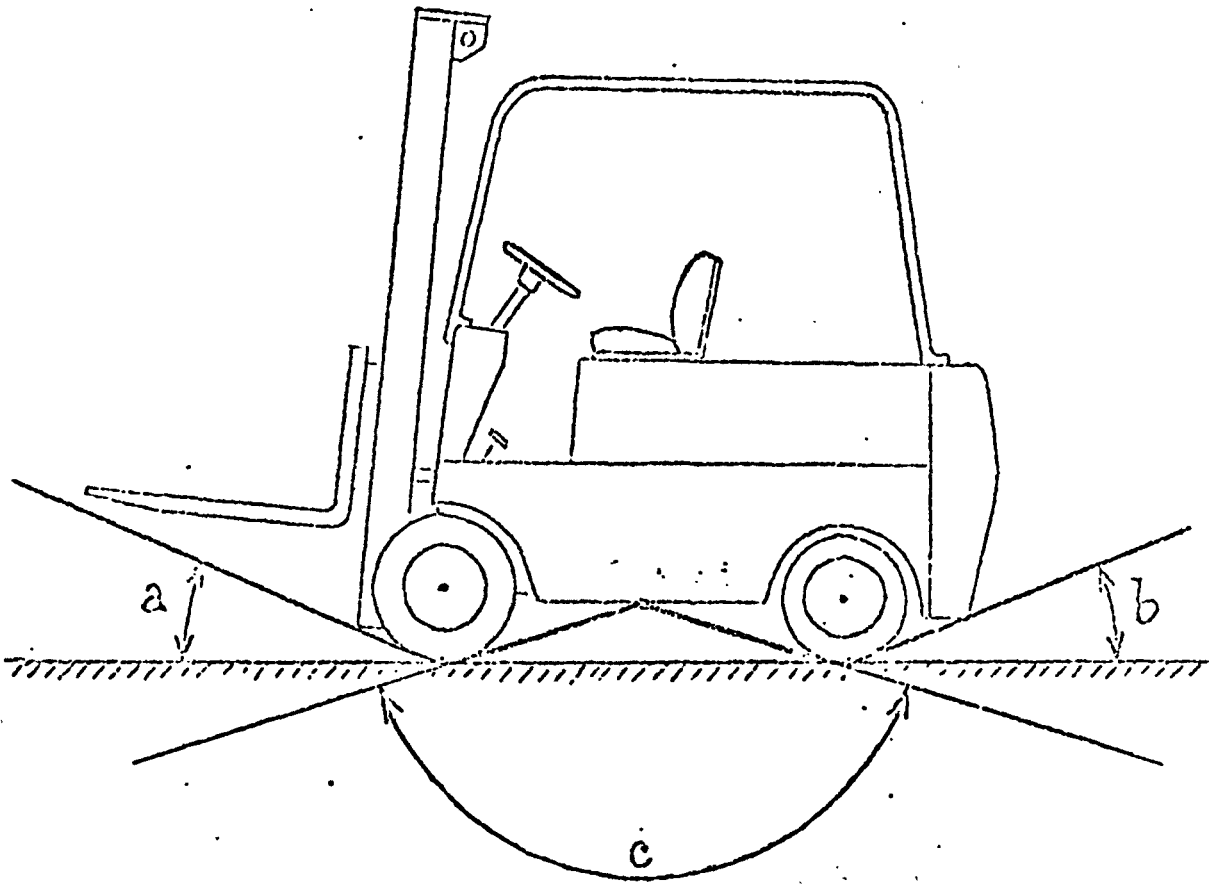
- 8.2.3. Mass of traction battery unit
Mass of the battery unit i.e. : battery, container and ballast if any
- 8.2.4. Load per axle (front, rear) of the truck in working order, unladen
- 8.2.5. Load per axle (front, rear) of the truck in working order, with rated load
- 8.2.6. Load per wheel (front, rear) of the truck in working order, unladen
- 8.2.7. Load per wheel (front, rear) of the truck in working order, with its rated load
- 8.2.8. Track
- 8.2.9. Wheel base
- 8.2.10. Rated capacity (see chapter 9)
- 8.2.11. Load centre distance (*)
- 8.2.12. Overall dimensions (*)
 - height { over mast, closed
 - { mast extended
 - { over cab or overhead guard
 - length without fork arms (*)
 - width (*)
- 8.2.13. Free lift height (*)
- 8.2.14. Maximum lift height at rated load (*)
- 8.2.15. Maximum lift height (*)
- 8.2.16. Overhang : front, rear, lateral
- 8.2.17. Ground clearance under mast
- 8.2.18. Ground clearance at centre of wheel base

(*) See sketch page 13 .

8.2.19. Ramp angles in relation to the horizontal plane

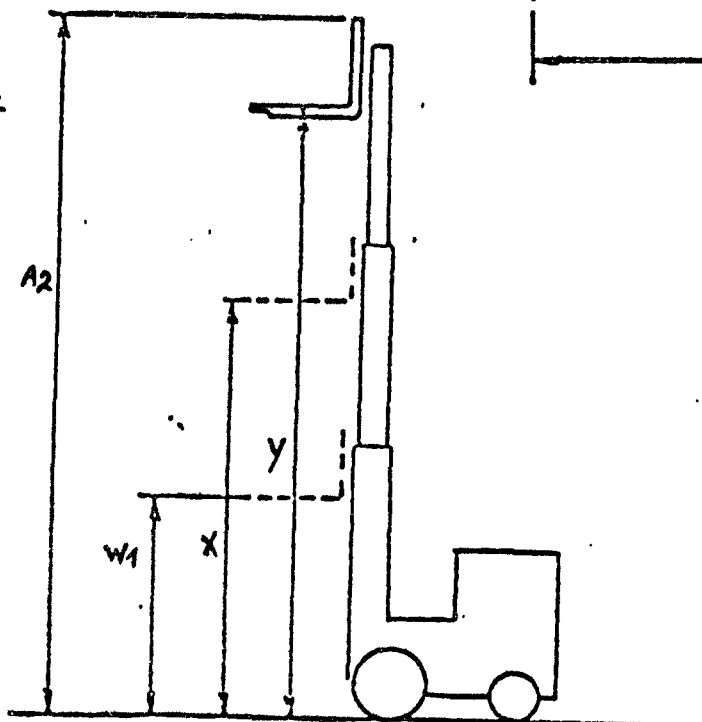
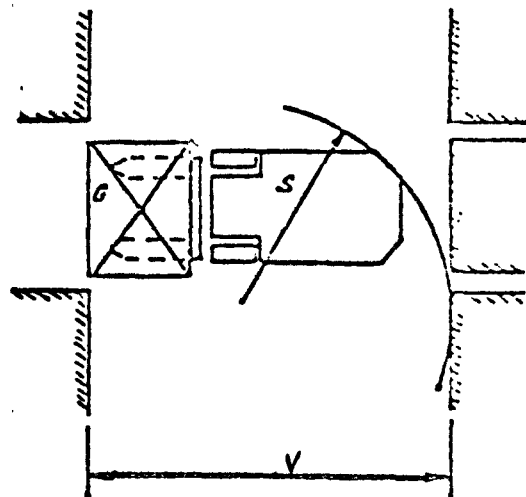
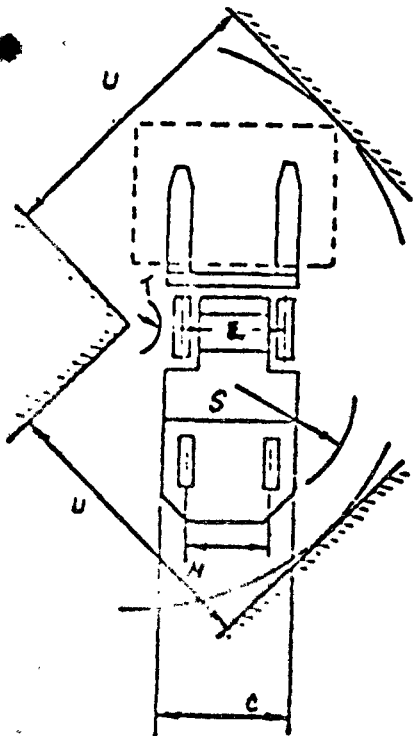
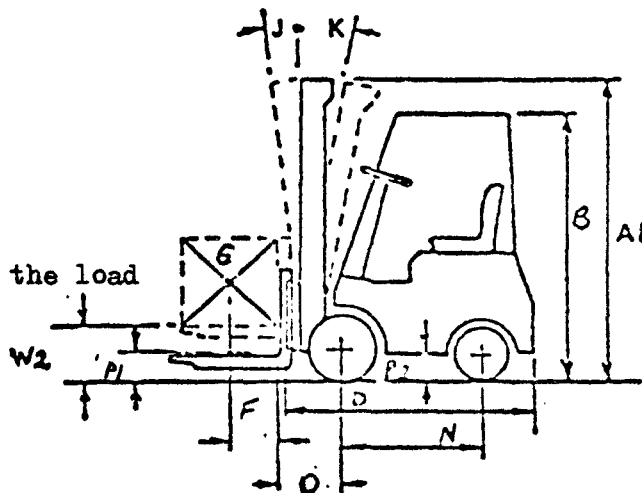
- a) approach angle (maximum)
- b) departure angle (maximum)
- c) traverse angle (minimum)

(See sketch below)



(*) DIMENSIONAL CHARACTERISTICS

- A1 Height over mast, closed
- A2 Height over mast, extended
- B Height over cab or overhead guard
- C Overall width
- D Length, without forks
- E Length of fork
- F Distance from centre of gravity of the load
- G Centre of gravity of the load
- J Forward tilt (in degrees)
- K Backward tilt (in degrees)
- L Front track
- M Rear track
- N Wheelbase
- O Forward overhang
- P1 Ground clearance under mast
- P2 Ground clearance at centre of wheel base
- S Outside turning radius
- T Inside turning radius
- U Width of theoretical minimum intersecting aisles
- V Width of theoretical minimum aisle for right-angle stacking
- W Free lift height; W1 total free lift; W2 reduced free lift
- X Maximum lift height at rated load
- Y Maximum lift height



- 8.2.20. Outside turning radius minimum (*)
- 8.2.21. Width of theoretical minimum intersecting aisle (*) - laden and unladen
- 8.2.22. Width of theoretical minimum aisle for right-angle stacking (*)
- 8.2.23. Draw bar pull
- 8.2.24. Maximum negotiable gradient on which the truck can start moving either laden or unladen
- 8.3. Specific operating terms
- 8.3.1. Engaging the load
- 8.3.2. Disengaging the load
- 8.3.3. Lifting the load
- 8.3.4. Lowering the load
- 8.3.5. Stacking - unstacking
Stacking : Handling consisting of lifting a load, and placing it on a stack composed of similar loads.
Unstacking : Handling consisting of removing a load from the topmost position in a stack, and lowering.
- 8.3.6. Tiering - untying
Tiering : Handling consisting of lifting a load and placing it on a rack or shelf in a storage system.
Untiering: Handling consisting of lifting a load from a rack or shelf and lowering.
- 8.3.7. Tilting the mast (or fork) forward - backward
- 8.3.8. Extension or retraction of the mast or fork (forward - lateral)
- 8.3.9. Travelling
- 8.3.10. Inching
Small movements of a truck, operated at reduced speed (not more than 2.5 km/h) to enable a load to be positioned precisely during a handling operation, (e.g. stacking)
- 8.3.11. Towing
- 8.3.12. Coupling - uncoupling
- 8.3.13. Rotating - attachments
- 8.3.14. Pivoting (mast or attachments)
Rotation of the entire lifting assembly or of a single load-carrying unit about a vertical axis, to allow lateral changes to be made from the frontal position or vice versa.
- 8.3.15. Load push - load pull
- 8.3.16. Side shifting
- 8.3.17. Spreading the fork arms

(*) See sketch page 13.

- 8.3.18. Rotating fork arms
- 8.3.19. Clamping - unclamping
- 8.3.20. Load stabilization
- 8.3.21. Scooping-emptying
- 8.3.22. Lowering stabilizers - raising stabilizers (for side loading trucks)
- 8.3.23. Tipping
- 8.4. Safety features
- 8.4.1. Stability
 - Ability of a truck, either in the loaded or unloaded condition, to resist overturning as a result of static or dynamic forces arising in service.
 - 8.4.1.1. Longitudinal stability
 - Resistance to overturning forward or backward
 - 8.4.1.2. Lateral stability (transverse stability)
 - Resistance to overturning to right or left
 - 8.4.1.3. Static stability
 - Resistance to overturning of a stationary truck solely under the action of its load.
 - 8.4.1.4. Dynamic stability
 - Resistance to overturning of a moving truck under the action of forces developed when:
 - 8.4.1.4.1. travelling in a straight or curved path
 - 8.4.1.4.2. when the load is moved in various ways
 - 8.4.1.4.3. during a movement combining (1) and (2)
- 8.4.2. Brakes
 - drawbar drag
 - stopping distance
- 8.4.3. Safety equipment
- 8.4.3.1. Guards for driving position
 - Complete or partial guards bordering the driving position, especially at extreme points, with the object of protecting the driver frontally and/or laterally against contact with fixed obstacles or other vehicles.
- 8.4.3.2. Overhead guard
 - Superstructure fixed on the truck above the head of the driver, to protect him from falling objects.
- 8.4.3.3. Load backrest
 - Vertical screen usually mounted on the fork carrier to prevent any part of the load transported from falling towards the operator.

- 8.4.3.4. Spark-arrester (IC engine)
- 8.4.3.5. Water-muffler
- 8.4.3.6. Exhaust gas purifier, catalyser
- 8.4.3.7. Flameproofing equipment
- 8.4.3.8. Battery discharge indicator
- 8.4.3.9. Safe load indicator
- 8.4.3.10. Horn
- 8.4.3.11. Starting switch
- 8.4.3.12. Safety switch (on an electric truck)

Switch to cut off the power supply to a traction motor (sometimes also applying the brake), as soon as the operator ceases to exert pressure on the part actuating the switch; this may be a seat or pedal on a rider controlled truck, or the tiller of a pedestrian-controlled truck.

- 8.4.3.13. Safety reverser
Device located at the end of the tiller of a pedestrian controlled truck, to reverse the direction of the truck when the device contacts the operator (or an obstacle).

- 8.4.3.14. Emergency switch
A device to switch off the motors of electric trucks, operating independently of the control switches and intended to ensure disconnection of the motor even in the event of the control switch system malfunctioning.

- 8.4.3.15. Driving mirror

- 8.4.3.16. Electrical overload device

- 8.4.3.17. Anti-collision device
Device located ahead of a remote control truck, which on contact with an obstacle or arrival in close proximity to one, is activated mechanically, optically, magnetically, or by other means, and cuts off the supply current to the traction motor whilst applying the brakes.

9. Capacity of trucks and removable attachments

9.1. High lift trucks

9.1.1. Rated capacity of high lift trucks

The rated capacity of a powered industrial high lift truck is the load in kg, permitted by the manufacturer, that the truck type is capable of transporting or lifting in normal operation under specific conditions (see Addendum A).

9.1.2. Actual Capacity of high lift trucks

The actual capacity of a powered industrial high lift truck is the maximum load in kilograms (depending on its attachment and elevating height), permitted by the manufacturer (usually by stability testing) that the subject truck is capable of transporting or lifting in normal operation under specific conditions (see Addendum A)

9.2. Fixed platform and low lift trucks

9.2.1. Rated capacity of fixed platform and low lift trucks

The rated capacity of a fixed platform or low lift truck is the maximum load in kilograms permitted by the manufacturer uniformly distributed over the load carrying platforms or device, which the truck is capable of transporting under normal conditions of operation.

9.3. Industrial tractors

9.3.1. Rated capacity of industrial tractors

The rated capacity of an industrial tractor is the rated horizontal draw-bar pull in newtons permitted by the manufacturer, that the industrial tractor can develop at a specified coupling height whilst moving at a uniform speed of not less than 1 % of the maximum no load speed, on a smooth, dry, horizontal concrete surface. For stand-on or sit-on industrial tractors the driver's mass shall be 90 kg (ballasted accordingly)

When pneumatic tyres are fitted they shall be inflated to the pressure specified by the industrial tractor manufacturer.

9.4. Removable attachments

9.4.1. Rated capacity of removable attachments is the maximum load in kilograms, permitted by its manufacturer, that the attachment is capable of handling in normal operation under specified conditions.

10. General provisions

10.1. Information plates

All the information on the plates shall be in the language (languages) of the country where the truck is to be used

10.1.1. Identification plates

10.1.1.1. Every industrial truck shall bear a durable identification plate in a prominent position giving the following information:

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All engine powered trucks	Battery-electric powered
a) Name of the manufacturer (or the importer) of the truck b) Type c) Production or serial n° and year of manufacture d) Unladen mass (*) of the truck in working order without removable attachments, but with the fork arms in the case of fork lift trucks	a) d° b) d° c) d° d) Unladen mass (*) of the truck in working order without battery and without removable attachments but with the forkarms in the case of fork trucks. e) Authorized maximum and minimum battery mass f) Battery voltage

10.1.1.2. Identification plates for removable attachments

Every removable attachment shall carry a separate identification plate giving the following information:

- a) name of attachment manufacturer (or importer);
- b) type;
- c) production or serial number and year of manufacture;
- d) mass of attachment;
- e) distance of the centre of gravity of the attachment from its mounting face on the truck;
- f) rated load capacity;
- g) in the case of hydraulically operated attachments the operating hydraulic pressure recommended by the attachment manufacturer;
- h) "warning!" The capacity of the truck and attachment combination shall be adhered to.

10.1.1.3. Trucks operating in special conditions

If a truck is designed to operate in special conditions it shall bear a durable plate in a prominent position, giving the following information:

(*) The mass may be slightly greater or less than that shown in the plate.

- a) designation of the special condition(s) of use;
- b) capacity of the truck in each of the special conditions of use.

10.1.1.4. Traction batteries and containers

Each container shall bear a durable identification plate in a prominent position giving the following information:

- a) name of battery manufacturer
- b) type
- c) serial number
- d) nominal voltage
- e) capacity in ampere hours at the 5-hour rate
- f) service mass (with ballast if used to compensate for lack of battery mass)

Furthermore, the mass shall be stamped on the removable container near the lifting means.

10.1.2. Capacity plates

Every truck or tractor shall have a durable capacity plate affixed in a prominent position, easily readable by the operator showing the data specified below.

This capacity plate may be combined with the identification plate if desired.

10.1.2.1. High lift trucks

The capacity plate shall show the data specified in Addendum B.

10.1.2.2. Fixed platform and low lift trucks

The capacity plate shall show the basic rated capacity in kilograms as defined in 9.2.1.

10.1.2.3. Industrial tractors

The capacity plate shall show the draw bar pull in newtons as defined in 9.3.1. and shall also show the period of time during which this pull can be exerted.

In the case of electric driven truck tractors fitted with torque convertors the draw-bar pull for one hour of operation shall be given.

10.1.3. Other information

It is not obligatory to put this information on a plate.

10.1.3.1. Devices for slinging of trucks

Locations for slinging shall be clearly indicated on the truck (see 10.8.4.)

10.1.3.2. Pneumatic tyre inflation pressures

The inflation pressures shall be clearly indicated on the truck.

10.1.3.3. Maximum authorized gradient

10.2. Immobilization, prevention of unintentional movement and unauthorized use

10.2.1. A parking brake shall be provided conforming to the requirements specified in 10.3.4.1. and 10.3.4.2. below.

The special requirements for order picking trucks are covered in Chapter 11

10.2.2. The truck shall be provided with a special device (e.g. by means of a key) which prevents its use by any unauthorized person

Switch keys for pedestrian controlled trucks and for stand-on and sit-on trucks shall not be interchangeable.

10.3. Brakes - Performance

10.3.1. Brakes

Powered industrial trucks shall embody brakes capable of developing in either direction, on smooth, level, dry and clean concrete, a minimum draw bar drag, 'F'.

The value of 'F' for:

- all trucks (except tractors) is expressed as a percentage of the gross mass of the truck with its rated load.
- tractors is expressed as a percentage of the gross mass of the tractor, without trailers.

The minimum value of 'F' is related in the following tables to the maximum speed attainable by the truck with its rated load or by the tractor without trailers ('V₁' in km/h).

If a truck's actual braking capability is automatically related to speed, the minimum draw bar drag 'F' may be varied as speed is varied. (see graph A).

The minimum value of 'F' in the following tables must be attainable with the appropriate actuating force specified in Point 10.3.2.

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Group	Types of truck	Value of 'F' for :-	
		$V_1 \leq 13.4 \text{ km/h}$	$V_1 > 13.4 \text{ km/h}$
A*	All industrial trucks except groups B, C & D	$F \geq 1.86V_1\%$	$F \geq 25\%$
B	tractors with 1 or 2 braked wheels	$F \geq 2.6V_1\%$	$F \geq 35\%$
C	tractors with 4 braked wheels	$F \geq 3.72V_1\%$	$F \geq 50\%$

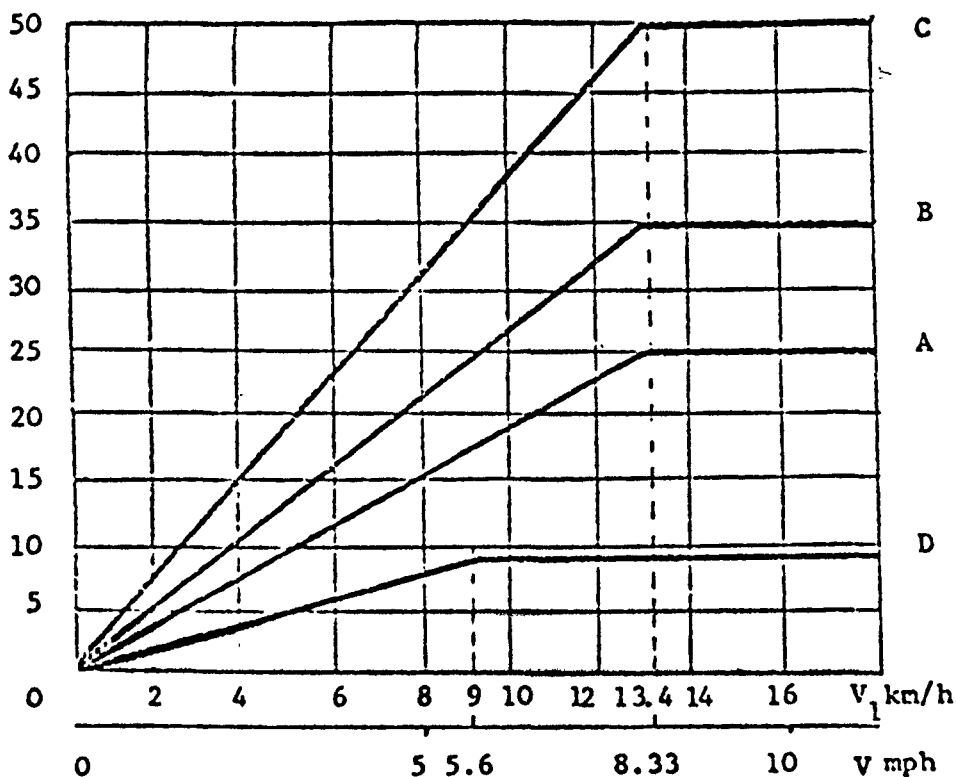
		Value of 'F' for :-	
		$V_1 \leq 9.0 \text{ km/h}$	$V_1 > 9.0 \text{ km/h}$
D**	Trucks with elevating operator and High Lift Lateral (and front) Stacking Trucks	$F \geq 1.0V_1\%$	$F \geq 9\%$

* Where the mast or fork arms can be moved out, the values shall apply with the mast or fork arms in the retracted position.

** For further details see Points 11.1. and 11.2.

GRAPH A

FZ



- C tractors with 4 braked wheels
- B tractors with 1 or 2 braked wheels
- A all industrial trucks except groups B, C and D
- D trucks with elevating operator and high lift lateral (and front) stacking trucks

10.3.2. Service brake controls (*)

- a) Brakes applied by depressing the brake pedal shall conform to the above drawbar drag table with a maximum pedal force not exceeding 600 N.
- b) Brakes applied by releasing the brake pedal shall conform to the above drawbar drag table. The necessary force required to release the brakes and to keep them released while travelling shall not exceed 300 N.
- c) Brakes applied by means of a hand lever shall conform to the above drawbar drag table, when a maximum force of 150 N is applied to the hand lever.
- d) Automatically applied brakes on trucks with the driver standing, and pedestrian controlled trucks shall conform to the above drawbar table.

(*) Order-picking trucks are covered in Chapter 11.

10.3.3. Only friction brakes, hydrostatic transmissions and electrical braking systems are acceptable as service brakes.

10.3.4. Parking brake

10.3.4.1. Each industrial truck except an industrial tractor shall be equipped with a parking brake which shall hold the truck, with its maximum permissible load, without assistance from the driver, on the service gradient specified by the manufacturer. The gradient must not exceed the values shown below:

- a) Sit-on or stand-on trucks, electric or I.C.E. except types b and c 15 %
- b) Narrow-aisle trucks (reach trucks) straddle trucks, pallet stackers, high-lift platform trucks, or low lift trucks 10 %
- c) Order-picking trucks, high-lift and lateral stackers 5 %
- d) Pedestrian controlled trucks 10 %

10.3.4.2. Each industrial tractor with the exception of driverless tractors shall be equipped with a parking brake which shall hold the tractor itself, without trailers, and without assistance from the driver on the maximum gradient that it is able to climb (without load) or on the following gradient, whichever is lower.

- Sit-on or stand-on tractors, I.C.E. or electric 15 %
- Pedestrian-controlled tractors 10 %

10.3.4.3. Brake operating systems

Service and parking brakes shall be operated by means of independent systems, but may be effective on the same arresting equipment (e.g. brake shoes).

This does not apply to trucks which have the type of automatic service/parking brake specified in Point 10.3.2. b) and d).

10.4. Wheels

When split wheels are used with pneumatic tyres, the truck shall be provided with devices to prevent the user from separating the halves of the wheel before removing the wheel from the axle.

10.5. Controls

10.5.1. Direction of travel controls

10.5.1.1. Applicable up to and including 31.12.1984

in accordance with ISO-Standard 3691 (Points 8.1. to 8.2.3.3., 8.3.1. a), b), e) 8.3.1.1. to 8.4.3.2.

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10.5.1.2. Applicable from 1.1.1985

in accordance with ISO-Standard 3691, Points 8.1. to 8.2.3.3.,
8.3.1. a), b), e),
8.3.1.1. to 8.4.3.2.

with the following modifications:

8.4.1.1. Pedals

Accelerator and service brake pedals and clutch pedals when fitted to sit-on trucks shall be arranged in accordance with automotive rules and practice as shown in Figure 25 (the paragraph which follows is deleted).

8.4.1.2. Gear-change lever

The positions for gear engagement shall be clearly indicated

8.4.1.3. Direction-change lever

It shall be obligatory to operate the direction-change levers by hand. The direction-change levers shall be arranged in such a way that their operation corresponds to the required direction of travel.

8.4.1.4. Safety control and brakes - sit-on electric-powered trucks

- The first two paragraphs have been retained;
- the last three paragraphs have been replaced by :

The accelerator shall be operated by the right foot and shall increase travel speed when depressed. The service brakes shall be operated by the right foot and shall be applied by depressing the pedal.

8.4.1.5. Safety control and brakes - sit-on internal combustion engine powered trucks

- The first clause of the first paragraph is retained;
- the second clause of the first paragraph is replaced by:

The accelerator shall be operated by the right foot and shall increase travel speed when depressed.

The two following paragraphs are replaced by:

The service brakes shall always be operated by the right foot and shall be applied by depressing the pedal. If a clutch is fitted, declutching shall be carried out by pressing on the pedal with the left foot. This pedal may also operate the brakes. In the latter case, one large pedal may be utilized to carry out both operations provided its surface area is approximately equal to the total surface area of the brake and clutch pedal shown in Figure 25. Declutching shall be effected by the initial depressing movement of the pedal, the final movement shall apply the brakes.

10.5.2. Load handling controls

in accordance with ISO-Standard 3691 (Point 8.5.)

10.5.3. Control symbols

in accordance with ISO-Standard 3287

10.6. Speed limitation (*)

10.6.1. Pedestrian controlled trucks shall be so designed that they shall not be capable of speed in excess of 6 km/h in the unladen condition when operating on level ground.

Exception:

In special areas separated from pedestrians and other types of traffic remote controlled trucks may be operated at higher speeds.

Single speed pedestrian controlled trucks shall be so designed that they cannot reach a speed in excess of 4 km/h, empty and on level ground, or a maximum acceleration of 5 %. Single speed trucks shall be low lift only.

10.6.2. Stand-on trucks shall be so designed that they shall not be capable of speeds in excess of 16 km/h in the laden condition when operating on level ground.

10.6.3. It is recommended that sit-on and stand-on trucks having a speed greater than 12 km/h be fitted with a speedometer adapted to the speed conditions of use and to facilitate adherence to speed regulations.

10.7. Requirements for power systems and accessories

10.7.1. Internal combustion engine driven trucks

10.7.1.1. Exhaust and cooling systems

10.7.1.1.1. The exhaust system shall be designed and fitted with due consideration for the comfort and well-being of the operator and other personnel. In particular, the exhaust pipe whether it is placed in a low or high position shall have its exhaust port so arranged as to cause the minimum discomfort to personnel.

10.7.1.1.2. The air flow through the cooling system shall be arranged in a manner to avoid discomfort to the operator.

10.7.1.2. Fuel tanks

If a tank is within or contiguous to the engine compartment, the tank and/or filling arrangement shall be isolated from the electrical and exhaust systems by a separate enclosure or by baffles. The tank location and facilities for filling shall be such that spillage or leakage will drain to the ground and not into the engine or operator's compartment or on to electrical or exhaust system parts. Fuel spillage shall not be possible under operating conditions.

10.7.1.2.1. Applicable up to and including 31.12.1984

The fuel tank and fill fittings shall be so located as to minimise the possibility of damage to the tank and its fittings.

(*) Order-picking trucks are covered in Chapter 11.

10.7.1.2.2. Applicable from 1.1.1985

The fuel tank shall be removable. The fuel tank and fill fittings shall be so located as to minimise the possibility of damage to the tank and its fittings.

10.7.1.3. Fuel systems shall be firmly secured to the truck and the fastenings arranged to minimise the effects of vibration.

10.7.2. Additional requirements for internal combustion engine driven trucks, using LPG gas.

10.7.2.1. Containers

10.7.2.1.1. The container(s) for LPG may be either permanently fixed on the truck or quickly removable. Containers shall comply with the requirements of existing Community Directives.

10.7.2.1.2. Containers shall be fitted on the truck in such a way that they are not unduly exposed to erosion nor to the corrosive action of the products handled by the truck.

They shall be protected against corrosion.

10.7.2.1.3. The containers shall be firmly secured to the truck and the fastening shall be unaffected by vibration.

10.7.2.1.4. Containers, whether fixed or removable, shall be equipped with a device to prevent the sudden emission of a large volume of gas, particularly in the case of a pipe failure. The fuel take off on the container shall be equipped with an easily and quickly accessible manually operated valve. The fuel take off shall be in a liquid form, unless the container and engine are specially equipped for direct vapour withdrawal.

10.7.2.1.5. All containers which require to be filled to a fixed maximum liquid level by the user shall have the following fittings:

a) A suitable safety pressure relief valve connected to the vapour space of the container. Where such containers are fitted inside compartments of vehicles the discharge side of the relief valve shall be piped to atmosphere.

The gas shall be led away safely.

b) A fixed maximum level indicating device. Where containers are fitted inside compartments of vehicles the discharge side of any maximum level indicating device which relies on bleeding gas to atmosphere shall terminate at a readily visible position on the outside of the vehicle.

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1. The maximum level indicating device, which relies on bleeding to atmosphere shall be designed so that the bleed hole is not larger than 1.5 mm diameter and also that the parts of the device cannot be completely withdrawn in normal gauging operations.
2. All maximum liquid level devices shall be suitable for the LPG in use and indicate the maximum product level which shall not exceed that permitted by Community regulations for pressure vessels in so far as they exist or otherwise to the provisions of the country in which they are used.

c) If a liquid level gauge is fitted, it shall not vent to atmosphere.

- 10.7.2.1.6. If containers are installed in a compartment, this compartment shall have permanent openings at the very bottom. The total surface area of these ventilation openings shall be at least 200 cm² allowing adequate ventilation to the outside atmosphere and without risk for the operator.
- 10.7.2.1.7. When containers are removable, their fastening shall permit easy handling and easy checking of installation after the exchange of containers.
- 10.7.2.1.8. When installing removable containers which incorporate a safety relief valve they shall be so located on the truck that the safety pressure relief valve opening is always in communication with the vapour space (top) of the container. This may be accomplished by an indexing pin which positions the container when the container is properly installed.
- 10.7.2.1.9. If a spare or additional container is carried on the truck, it shall be secured in an approved manner as laid down in Points 10.7.2.1.3. and 10.7.2.1.8.
- 10.7.2.1.10. Protective caps against inclement weather shall be provided on the connections when stored in the open.
- 10.7.2.1.11. Provision shall be made for the possible fitting of a heat-shield to ensure protection against abnormal increases in temperature of the liquified petroleum gas (LPG) container, which might be caused by the sun or other heat sources. Containers shall be positioned as far away as is practical from the motor and the exhaust system.
- 10.7.2.2. Piping
- 10.7.2.2.1. Connecting piping and all associated parts shall be easily accessible, protected against damage and wear, and be flexible enough to withstand vibration and deformation in service. Pipe work shall be:

- 1) so arranged that damage or leaks are easily detectable and

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2) shall be installed in such a way that it cannot be damaged by the hot parts of the engine.

Fully rigid pipes shall not be used for connecting the container to equipment on the engine.

- 10.7.2.2.2. Hoses, piping and all connections operating at pressure above 1 bar gauge shall be suitable for a working pressure of 25 bars and shall withstand without bursting a test pressure of 75 bars.
- Hoses, piping and all connections operating below 1 bar shall withstand, without bursting a test pressure of 5 times the maximum pressure likely to be encountered in service.
- 10.7.2.2.3. The containers and their connections shall be installed in such a way that there are no projections outside the overall contour of the truck. Container connections shall be protected by a rigid guard.
- 10.7.2.2.4. Excessive pressure shall be avoided in any section of pipe-work containing LPG between two shut-off valves which may be closed; a pressure relief valve or other suitable means may be used if necessary.
- 10.7.2.2.5. The use of aluminium piping in the liquid lines is not permissible.
- 10.7.2.2.6. Hose lengths shall be as short as possible.
- 10.7.2.3. Equipment
- 10.7.2.3.1. The supply of gas shall be automatically cut off when the engine stops irrespective of whether or not the ignition system has been switched off.
- 10.7.2.3.2. For multi-fuel applications the system shall be designed to avoid the possibility of LPG entering any other fuel container, and so that each fuel source is cut off before the alternative one is opened.
- 10.7.2.3.2.1. If the truck is equipped with two or more containers to supply fuel, they shall be connected via a multiway valve, or other suitable means so that liquified gas (LPG) can be drawn only from one container at a time. The use of two or more containers (at the same time) is not permitted.
- 10.7.2.3.3. Safety pressure-relief valves or liquid level indicators shall be installed in such a way that they cannot discharge on truck components which represent a source of ignition.
- 10.7.2.3.4. If corrosion of a part will interfere with its proper functioning it shall be provided with a corrosion-resistant protective coating.

10.7.2.3.5. All fuel system components shall be firmly secured to the truck and the fastenings arranged to minimise the effect of vibration.

10.7.3. Electric trucks

10.7.3.1. Battery

10.7.3.1.1. Metal covers shall be designed to provide an air space of at least 10 mm above the live parts of the battery. Alternatively the covers or live parts of the battery shall be insulated. The insulation must be firmly attached to avoid their disintegration or displacement in normal use.

10.7.3.1.2. The cover(s) shall be so constructed that in normal use no force shall be transmitted or contact made with the battery when a force of 980 N is applied to the cover(s) over any area 300 mm x 300 mm square.
The cover(s) shall be fitted in such a way as to avoid displacement in normal use.

10.7.3.1.3. Suitable ventilation holes shall be provided in the battery container, compartment or cover so that dangerous accumulations of gases shall not occur when the equipment is properly used.

10.7.3.1.4. Batteries and containers of all trucks shall be constrained to prevent unforeseen displacement in normal use. On rider lift trucks means shall be provided so that in the event of 90° overturning the battery assembly will be constrained, so as to avoid the risk of injury which could otherwise occur by the battery being displaced.

10.7.3.1.5. No sparking components shall be installed in the battery container or compartment. Battery connectors can be accepted as non-sparking components provided they are not part of an emergency isolation system (see 10.7.3.7.)

10.7.3.1.6. Voltage

The nominal battery voltage shall not exceed 96 volts.

10.7.3.1.7. Voltage limits

Electrical equipment shall be so designed that all functions shall operate and safety shall not be jeopardized if the battery voltage should fall below the nominal voltage (see Note 1) by as much as 30 %, i.e. to 0.70 x nominal voltage.

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NOTE 1:

Definition - Nominal voltage = maximum number of cells which are connected in series multiplied by the nominal voltage of each cell, e.g. 2.0 V for conventional lead acid cells, 1.2 V for conventional alkaline cells.

10.7.3.2. Connectors (other than charging connectors)

The connectors used for connecting the traction batteries to the equipment of electrically-operated industrial trucks, and to the charging equipment shall comply with the requirements of Addendum C.

10.7.3.3. It shall not be possible to energise the truck movement circuits whilst external charging leads are connected.

10.7.3.4. Resistors

All resistors shall be located and arranged so as to avoid overheating and damage to adjacent parts of the truck.

10.7.3.5. Protection

10.7.3.5.1. In the normal operating condition of the truck the uninsulated live parts shall be protected to prevent direct contact.

10.7.3.5.2. There shall be no electrical connection to truck frame, with the permissible exception of:

- a) frame fault detection system
- b) Lighting and ancillary equipment, providing its operating voltage does not exceed 24 volts and it is electrically isolated from the main power source.

10.7.3.5.3. Motor circuits shall be protected against short circuit conditions.

Auxiliary circuits shall be protected against short circuits conditions and dangerous excess currents. Several auxiliary circuits in parallel, with combined current not exceeding 10 A, may be protected by a single device.

10.7.3.5.4. The electric circuits shall be so designed, and if necessary protected, that two or more frame faults cannot cause uncontrolled operation.

10.7.3.5.5. Pulse switching systems shall be so arranged that in the event of any fault in the electronic circuit an uncontrolled power-on condition is avoided. Alternatively each system may be duplicated and cross-monitored. Means shall be provided for checking the operation of this safety circuit or system.

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10.7.3.5.6. Verification of the dielectric properties

- I) Type test - over voltage (see 10.7.3.9.).
- II) Routine test - insulation resistance (see 10.7.3.10.).

10.7.3.6. Conductors

The cross sectional area of conductors shall be so selected that during operation of the truck, the temperature shall not exceed that specified for the class of insulation used.

Electric cables shall be installed in such a way that they are protected from mechanical damage when the truck is in normal service.

The following provisions apply to conductors external to enclosures (excluding component flying leads):

- a) all conductors shall be flexible.
- b) the cross sectional area of conductors of adequately supported cables and wiring harnesses shall not be less than 0.5 mm^2 .
- c) single conductors shall have a cross sectional area not less than 1.0 mm^2 .

10.7.3.7. Emergency Isolation

An emergency isolating control or controls shall be provided which shall be readily accessible to the operator at all times whilst in any of the operating positions recommended by the manufacturer. The isolating device shall simultaneously isolate all poles of the main supply lines and shall be capable of interrupting the normal maximum current (including motor starting current) by one of the following methods:

- a) connector specified in 10.7.3.2.
- b) manual isolator
- c) emergency switch connected into the coil circuit of two separate contactors.

10.7.3.8. Electro-mechanical brakes

Where electro-mechanical brakes are fitted these shall be mechanically applied and electrically released.

10.7.3.9. Dielectric type test

For ex-works, new, dry vehicles and with disconnected traction battery, an alternating test-voltage between 25-100 hertz shall be used for testing between live parts and the frame.

Semi-conductors or similar electronic components liable to become damaged by application of the test voltage may be by-passed or removed.

If there should be need to re-check, the alternating test voltage may be reduced to 80 % of the test voltage specified in the table.

The alternating test voltage shall be as follows:

<u>Nominal voltage</u>	<u>Alternating test voltage</u>	<u>Testing time</u>
≤ 48 V	500 V	} 1 minute
≥ 48 V	1 500 V	

10.7.3.10. Dielectric routine test

The insulation in industrial trucks must possess adequate electrical resistance.

As a routine test the industrial truck and traction battery shall be checked separately. The test voltage shall be greater than the nominal voltage and less than 500 V.

The insulation resistance between live parts and frame of all electric components of the industrial truck shall be deemed adequate if it amounts to at least 1,000 ohms per volt of the battery nominal voltage.

The insulation resistance of the traction battery shall be deemed adequate if it is at least 1,000 ohms between the live parts and the container.

10.7.3.11. Safety devices for electrical and electronic circuits

The electrical and electronic circuits of safety devices mentioned in the following points:

- 10.7.3.7. Emergency isolation;
- 10.10.5. Protection of operator, pedestrian controlled trucks;
- 11.1.1.2. } Reduction of speed and braking;
- 11.1.1.3. }
- 11.1.2.1. }
- 11.1.1.4. Speed limitation and prevention of travel;
- 11.2.5.2. Slack wire-ropes or slack chains;
- 11.2.5.11. A second limiting device at the top of travel,

shall be so designed and fitted that even in the event of one or several faults they remain fail-safe.

In the case of mechanically operated switches their operation shall be effected by opening of the circuit but through a minimum of intermediary devices. Their operation must not solely depend on weights or drag.

Note:

Where it is not possible to satisfy the above requirements by a simple electrical or electronic circuit, it is possible to duplicate the electrical or electronic circuits in order to check their correct functioning. A fault must cause the motion to stop and re-starting must not be possible until the circuit has been restored.

10.8. Systems and components for lifting, tilting and other movements

10.8.1. Lifting and tilting mechanism (1)

10.8.1.1. Mast mechanism chains

Only leaf and roller mechanical chains are authorized

When the lifting mechanism includes chains, the truck manufacturer shall select chain which, in relation to the minimum breaking load certified by the manufacturer of the chain, will provide a factor *) of at least 5/1 in relation to the static load that would exist in equally loaded chains when the maximum rated load is in the transporting position, assuming no friction in the mast structure. Pulley diameters shall be at least 3 times the pitch of the chains.

10.8.1.2. Wire-ropes

When the lift mechanism includes wire-ropes the truck manufacturer shall select a wire-rope which, in relation to the minimum breaking load certified by the manufacturer of the wire-rope, will provide a factor *) of at least 6/1 in relation to the static load that would exist in equally loaded wire-ropes when the maximum rated load is in the transporting position, assuming no friction in the mast structure. The minimum diameter of the wire-rope guide pulleys, measured from the bottom of the groove shall be equal to 22 times the diameter of the wire-rope.

10.8.1.3. Hydraulic lifting cylinders

Lift cylinders when loaded to the rated load conditions of the truck and connected through the hydraulic circuit of the truck the total leakage of the complete hydraulic lifting system (cylinders, distributor, etc.) shall only allow a descent of the load lower than 100 mm in the first 10 minutes with the hydraulic oil at normal working temperature.

10.8.1.4. Limitation of stroke of lifting system

The lift assembly shall be designed to provide positive stops to prevent over-travel. In addition means shall be provided to prevent the fork carrier and moving elements of the mast structure disengaging from the upper end of the mast. All movements with a limited travel shall be provided with positive stops to prevent over-travel.

(1) Order-picking trucks are covered in Chapter 11.

*) $K = \frac{\text{minimum breaking load when new}}{\text{carrying capacity} + \text{dead mass}}$

- 10.8.1.5. Lowering speed limitation
- A control device shall be incorporated in the lift circuit which even in the event of a failure of the hydraulic circuit shall restrict the rate of descent speed of the loaded lifting mechanism as much as possible. In no case shall the speed exceed 0.6 m/s.
- 10.8.1.6. Hydraulic tilting systems
- The total leakage rate of the complete hydraulic tilting system (cylinder, distributor etc.) shall only allow a pivoting of the mast to the front of less than 5 degrees in the first 10 minutes, from the vertical mast position when the truck is raising its rated load at a height of 2.5 m or in the case of trucks of less than 2.5 m at their maximum height.
- The pivoting speed shall not exceed $\frac{1}{2}$ a degree in one minute for trucks with a maximum tilt of less than 5 degrees.
- 10.8.2. Hydraulic systems
- 10.8.2.1. Hydraulic circuits
- Hoses, piping and all connections shall be capable of withstanding without bursting a pressure at least equal to three times the operating pressure to which they might actually be subjected.
- 10.8.2.2. All hydraulic systems shall include a reliable device which prevents the pressure in the system from exceeding a preset safe level (pressure relief valve).
- The device shall be so designed and fitted that accidental loosening or adjustment is avoided and that a tool or key is required to alter the pressure setting.
- 10.8.2.3. In the case of a fault or an interruption of the supply of energy, the design of the hydraulic installation shall be such that the hydraulic pressure in the system does not cause the pump to function as an hydraulic motor.
- 10.8.2.4. The hydraulic system shall be designed and installed in such a way that its performance and reliability are not reduced or its components damaged as a result of external stresses, vibration or movements of the truck or components thereof, etc. .
- 10.8.2.5. The hydraulic system shall be so designed that the oil in circulation is continuously and automatically filtered.
- 10.8.3. Fork arms and carrier
- 10.8.3.1. Fork arms - Technical characteristics and testing in accordance with ISO International Standard 2330.

10.8.3.2. Fork arms - lateral locations

Means shall be incorporated in the fork arm and carrier to prevent unintentional lateral displacement. Positive stops shall be provided to prevent lateral disengagement at the extremities.

10.8.3.3. Fork extensions

Fork extensions shall be designed to prevent accidental disengagement from the fork arm.

10.8.4. Slings devices

The slinging devices shall be so designed as to avoid any accidental risk of unhooking.

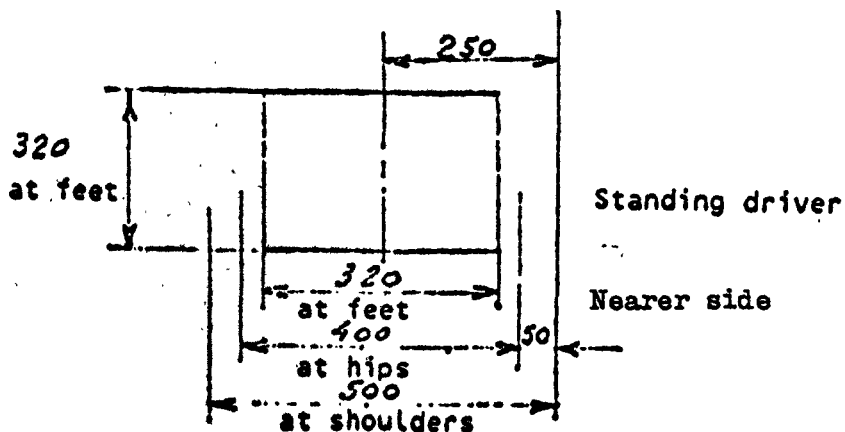
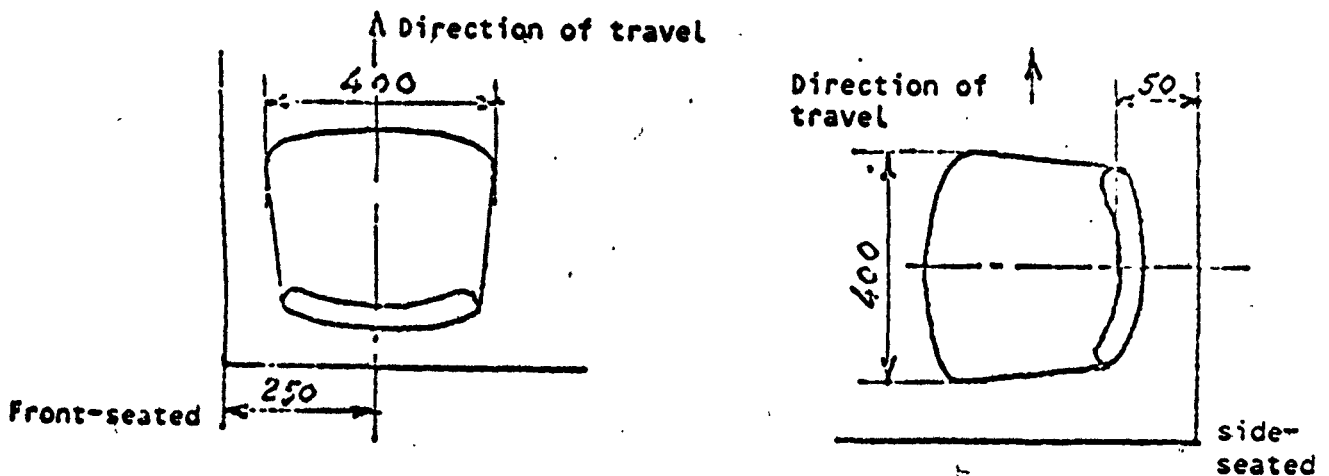
10.9. Operator's position

10.9.1. Dimensions

The operator's seat or standing position shall be so constructed that while operating the truck the operator shall have room to withdraw within the plan outline of the truck.

The dimensions shall not be less than the following dimensions in mm:

Seated driver



Note: Positions of the operator place, other than front or side facing are also permitted and equivalent dimensions apply.

10.9.2. Access

Rider trucks shall be designed to permit easy access and egress without undue risk of slipping or falling.

The surface of the floor shall be slip resistant. An adequate number of steps or running boards fitted with slip resistant surfaces or coverings shall be provided.

Each step or running board shall have a height above that next below it or above the ground of preferably 550 mm and shall not in any case exceed 700 mm. Safety handles shall be provided as necessary.

10.9.3. The operator's seat shall be adequately upholstered and, if necessary, resiliently suspended to minimise the transmission of vibration to the operator's person.

10.9.4. Temperature

The operator's seat and all parts of the truck within reach of the operator when in his normal operating position or when getting into or leaving his operating place shall be insulated, if necessary, against excessive temperature arising from the engine or other equipment.

10.10. Protective devices

10.10.1. Operator's overhead guard

It shall be possible to equip every high lift industrial truck with an overhead guard to protect the operator. (This does not include pedestrian controlled trucks or pedestrian trucks with provision for the operator to ride).

Over head guards shall conform to the following requirements:

10.10.1.1. Design features

10.10.1.1.1. General

The overhead guard shall extend over the operator under all normal circumstances of truck operation.

10.10.1.1.2. Failure of the tilting mechanism shall not, directly or indirectly, involve injury to the operator by reason of failure of the overhead guard.

10.10.1.2. Dimensions

10.10.1.2.1. The overhead guard should be designed and constructed in a manner that does not interfere with good visibility.

10.10.1.2.2. Openings on the top of the overhead guard shall not exceed 150 mm in one of the two dimensions width or length.

10.10.1.2.3. For rider seated trucks, a vertical clearance of at least 1000 mm shall be provided from the point of maximum depression of the seat under the operator, to the underside of the guard in the vicinity of the operator's head when he is in his normal operating position.

10.10.1.2.4. For rider standing trucks, a vertical clearance of at least 1880 mm shall be provided from the platform on which the operator stands to the underside of the overhead guard in the vicinity of the operator's head when he is in his normal operating position.

10.10.1.2.5. The operator's overhead guard shall not hinder the driver while he is mounting or dismounting the truck.

10.10.1.3. Testing of overhead guards

10.10.1.3.1. General

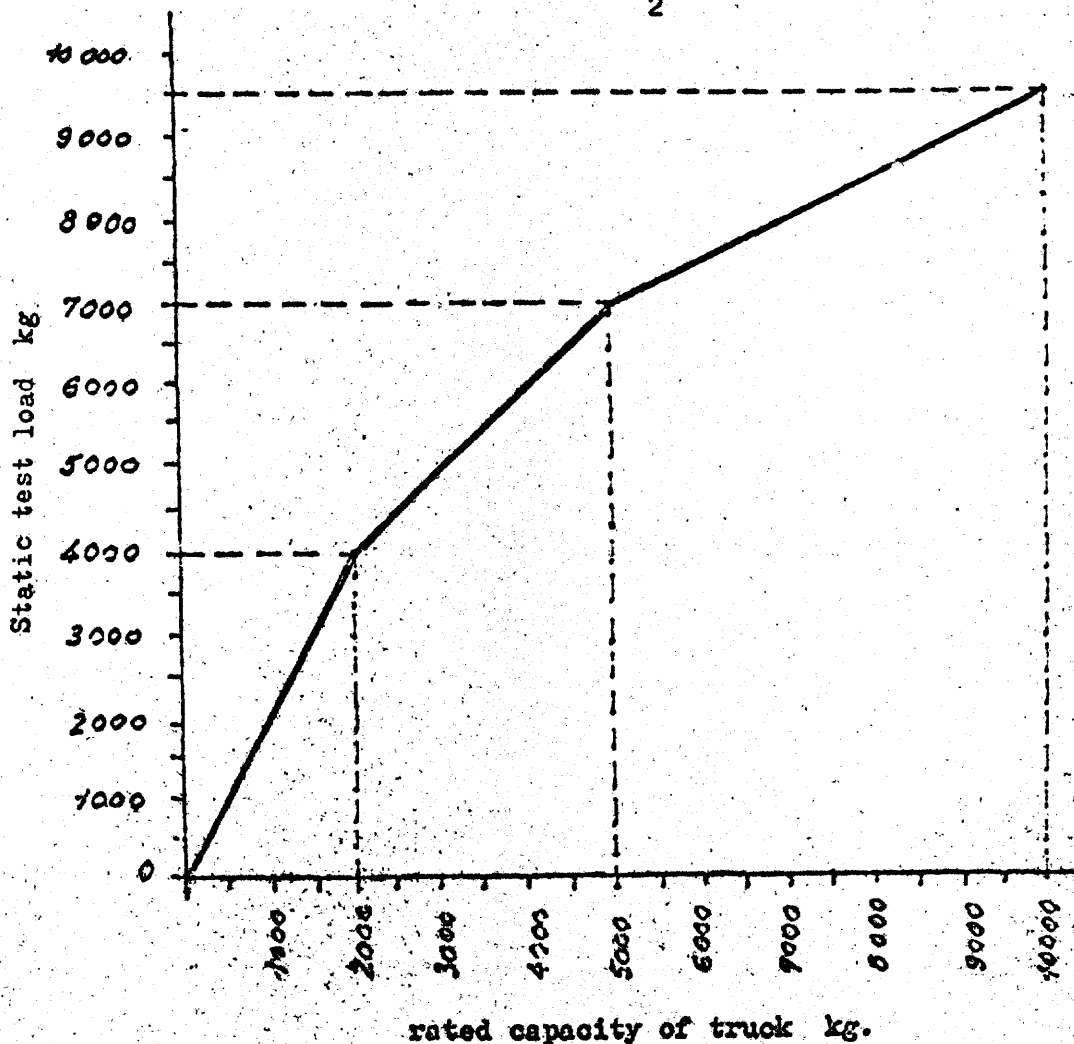
To test protection of the operator from falling objects (but not the impact of a falling capacity load) the following tests are to be carried out on prototype guards fitted to a truck of the type for which it has been designed.

The mounting of the guards on a test chassis is also admissible provided that the mounting is the same as that on the truck for which it is designed.

10.10.1.3.2. Static test

The overhead guard shall be able to support for 1 minute a static rigid test load, uniformly distributed on the area of the upper part of the main frame, according to the following table and graph:

Rated capacity of truck Q kg	Static test load kg
Up to 2 000	$2 \times Q$ maximum 4 000 kg
from 2 000 to 5 000	$2\ 000 + Q$ maximum 7 000 kg
from 5 000 to 10 000	$4\ 500 + \frac{Q}{2}$ maximum 9 500 kg



10.10.1.3.3. A dynamic test

The overhead guard shall be able to withstand the impact of a hardwood cube, weighing not less than 45 kg.

The test cube shall be positioned to drop in free fall with a flat surface approximately parallel to the top of the overhead guard, and not strike with a corner or edge. The cube shall be dropped a distance of 1.5 m 10 times so that it strikes the guard at random points within a 600 mm diameter circle, whose centre is vertically above the centre point of the operator's seat or position.

10.10.1.3.4. Test results: static and dynamic

After both tests the guard shall not show fracture, parts separation or permanent vertical deformation exceeding 20 mm measured on the underside of the guard within a 600 mm diameter circle, whose centre is vertically above the centre point of the operator's seat or position.

10.10.1.3.5. Auxiliary fixtures

During the dynamic tests, the deformations that might occur on auxiliary fixtures such as wire mesh, cloth, toughened glass, etc. ... shall be ignored.

10.10.2. Load backrest extension

High lift trucks shall be designed so that they may be equipped with a load backrest extension.

10.10.3. Platform

10.10.3.1. Operator's stand-on platforms on end controlled trucks shall extend beyond the operator's position and be so designed that they could withstand a compression force corresponding to the mass of the laden truck and applied along the longitudinal axis of the truck with the outermost projection of the platform against a flat vertical surface.

Note:

For the purpose of this section, the operator's platform includes any surrounding reinforcement or parts of the truck which provides resistance to crushing of the platform.

10.10.3.2. Operator's stand-on platforms which overhang the truck shall be provided with guards at the side or front of the platform.

10.10.3.3. Operator's stand-on platforms which fold or pivot shall be equipped with means to prevent the unintentional folding or pivoting of this platform when the operator is standing thereon.

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10.10.3.4. Operator's fixed stand-on platforms which are at heights greater than 1200 mm above the floor, shall be equipped with rails or other equally effective means of protection 1), comprising top rails, intermediate rails and toe boards to a height not less than 900 mm or more than 1100 mm measured from the upper surface of the top rail to the platform, the toe boards having a minimum height of 100 mm. The rails should be capable of withstanding a force of 900 N applied in any horizontal direction.

Removable or hinged rails shall be constructed in such a manner that proper rail positioning is easily accomplished and a secured position is visibly discernible.

When hinged rails are provided they shall open only upward, inwards or sideways.

10.10.4. Wheel guards

Trucks with wheels which extend beyond the confines of the truck chassis shall be provided with devices which ensure the protection of the driver when he is in the normal operating position against objects thrown up by the wheels (e.g. mud, gravel, stones, bolts, etc. ...).

10.10.5. Protection of operator - pedestrian controlled trucks

The tiller of pedestrian controlled trucks shall incorporate a device to reverse the direction of travel or stop the truck should the tiller in its operating position come into contact with a solid body (e.g. the operator's person).

10.10.6. Warning devices

Rider controlled industrial trucks shall be equipped with a clearly audible warning device.

10.10.7. Crushing, shearing and trapping points

Relative moving parts present a hazard to the operator in his normal operating position.

Such parts shall be separated by the minimum distances specified hereunder:

Places where the operator's fingers can be trapped ... 25 mm

Places where the operator's hands or feet can be trapped 50 mm

Places where the operator's arms or legs can be trapped 100 mm

Alternatively it shall be considered a satisfactory solution if the danger points are adequately guarded.

10.11. Visibility

Visibility on high lift rider trucks.

1) Chains and wire-ropes are not considered as equally effective means of protection.

This requirement specifies a procedure by which the visibility of unladen industrial trucks fitted with forks or platform (*) may be ascertained in a direction through the mast and parallel to the forks.

10.12. Environmental conditions

10.12.1. Noise

The noise emission of a truck is to be measured in accordance with the following specifications:

10.12.1.1. Environmental noise

The maximum admissible noise level in the environment shall be 90 dB(A).

10.12.1.2. Noise at operator station

The maximum admissible equivalent noise level (Leq) at the operator's station shall be 90 dB(A).

10.12.2. Operator's cabin

10.12.2.1. If a cabin is fitted in lieu of an overhead guard it shall comply with the requirements of Point 10.10.1.

10.12.2.2. If a totally enclosed cabin is fitted with a heater, the heater's air intake shall be connected to a fresh air inlet.

10.12.2.3. Provision shall be made for adequate ventilation of the cabin.

10.12.2.4. If glass is used in the window apertures it shall be of the safety glass type.

10.13. Attachments

10.13.1. Attachments (e.g. clamps, side-shifters etc.) shall be designed and manufactured in such a way that unintentional detachment and lateral displacement are prevented.

Movements of the attachment and its parts shall be mechanically limited at the extreme positions.

10.13.2. Clamping devices shall be so designed that the clamping pressure when in the neutral position is automatically sustained. In the event of malfunctions in the power supply system of an attachment unintentional movement of parts supporting a load shall not be possible, nor unintentional separation from the load.

(*) Where trucks are fitted with attachments that may reduce visibility they shall be considered as partially loaded and driven as such.

- 10.13.3. If the attachment hydraulic circuit is equipped with its own adjustable pressure relief valve it shall include means to prevent accidental loosening or unauthorized adjustment.
- 10.13.4. Hydraulic lines (flexible and rigid) and couplings shall be so designed that the possibility of damage from accidental contact with objects is avoided.
The hydraulic coupling and hydraulic pressure of the attachment shall be compatible with the truck.
- 10.13.5. Attachments shall as far as technically possible be so designed and fitted to the truck that the driver has a satisfactory view of the roadway and of the load lifting member.
- 10.13.6. Crushing, sheering and trapping of attachments other than those which grip the load shall conform to the requirements laid down in 10.10.7.
- 10.13.7. The combined load moment of an attachment and its load shall not exceed the rated load moment of the truck to which it is fitted. The stability of a lift truck/attachment combination together with the load shall be verified by the truck manufacturer or according to his instructions.

When determining the residual lifting capacity of a truck/attachment combination, account shall also be taken of the impact that occurs when running up against the limit stops (e.g. with a side-shifter) under the nominal load.

10.14. Steering shock restriction

The transmission of road shocks to the steering of sit-on and stand-on trucks shall be limited to such an extent as to avoid injury to the operator's hand or arm.

10.15. Lights

Sit-on and stand-on trucks shall be so designed that it is possible to equip them when necessary with headlights, red lights and possibly a worklight mounted on a universal swivel.

11. Special requirements

Trucks with elevating operator position and trucks specifically designed to travel with elevated loads

11.1. General requirements

Trucks shall be so designed that when operating under their special conditions (see Addendum D) their stability enables them to travel safely whilst the lift mechanism or load orientating mechanism is being actuated, or with the lift mechanism elevated, laden and unladen, or such lesser operations as the manufacturer has decided and has limited the truck performance accordingly by automatic devices.

The following types of industrial trucks are excluded from Chapter 11.

- a) trucks without lift (non-elevating operator platform and load carrier)
- b) low lift order picking trucks, where the load is elevated just sufficient to facilitate transportation
- c) medium lift order picking trucks where the operator's platform can only be elevated up to and including 1,20 m
- d) "walk off" type order picking trucks whereby the operator leaves the truck platform or pallet and enters into the storage racks in order to move loads on to the platform or pallet.

11.1.1. Operating safety arrangements

11.1.1.1. Where truck stability depends on reduction of speed and/or braking at a certain lift height (or heights), operation beyond those limits shall be automatically prevented.

Where, above certain lift heights, the truck is only permitted to travel at creepspeed (not more than 2.5 km/h) operation above **this speed shall be automatically prevented.**

When a truck is designed to carry out three way stacking it shall have a device which automatically prevents:

- a) travelling at more than 2.5 km/h when the load is in the forward position,
- b) horizontal displacements of the load when the appliance is travelling.

This requirement does not apply when the manufacturer guarantees by some other means the stability of the truck.

11.1.1.2. Trucks designed to operate with elevated operator position or with elevated load in a free ranging mode (outside the guided stacking aisles) shall:

- a) be automatically prevented from travelling above 4 km/h when the operator position or the lifting mechanism is elevated more than 500 mm above its lowest position (see Fig. 1).
- b) be automatically prevented from travelling above 4 km/h when the operator position or lifting mechanism is elevated above 500 mm and not more than 2500 above the lowest position, and restricted to creep speed (not more than 2.5 km/h) at these elevations when the steering is turned more than 10° from a straight ahead position (see Fig. 1).

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- c) have traction automatically prevented or restricted to creep speed (not more than 2.5 km/h) when the operator position or the lifting mechanism is elevated more than 2500 mm above its lowest position (see Fig. 1).
- d) except at creep speed have traction automatically prevented when the load elevating mechanism is being operated.

11.1.1.3. When any part of a truck mechanism is able to intrude laterally into the racking space, a device or devices shall be provided that prevents such movements whilst the truck is travelling, lifting or lowering, and similarly prevent travelling except at creep speed (not more than 2.5 km/h), when the mechanism is extended or extending.

11.1.1.4. At lift heights where truck travel is restricted to creep speed (not more than 2.5 km/h), acceleration shall be automatically reduced to a rate not more than the maximum deceleration permitted by the manufacturer for that elevation.

11.1.2. Service Brakes

11.1.2.1. For operations outside the guided stacking aisles with the operator position or lifting mechanism not more than 500 mm above its lowest position, the brake draw-bar drag shall comply with the requirements of Point 10.3.1., group A, or alternatively the travel speed shall be automatically reduced to not more than 9 km/h (see Fig. 1).

11.1.2.2. When the operator position or the lifting mechanism is positioned more than 500 mm above its lowest position, both within the guidance aisles and free ranging, provided the braking capability is automatically related to speed, the brake draw-bar drag, F, in Point 10.3.1. may vary simultaneously with the speed in accordance with the formulae.

11.1.3. Safety requirements

All controls and their mechanisms and systems that initiate movements shall be biased to the safe position (movements stopped) and designed to fail safe. Where such an arrangement is not reasonably practicable, a warning system shall be fitted to indicate failure.

11.2. Specific requirements for trucks with elevating operator position

11.2.1. Speed

Trucks with an elevating operator position shall be so designed that their travelling speed in the laden condition when operating on level ground does not exceed 16 km/h (see Fig. 1).

11.2.2. Traction brakes

- 11.2.2.1. Service brakes and parking brakes may be operated by a common system. Where this arrangement is used, failure of the system shall result in application of the brakes.
- 11.2.2.2. Service brakes and parking brakes may employ common mechanical arresting equipment, e.g. brake shoes, cams and cam levers.
- 11.2.2.3. Brake actuation shall be by a control normally biased to the "brake-on" position. Removal of the operating force shall automatically apply the brakes to give a draw-bar drag consistent with stability (see Point 10.3.1., Group D). The extra braking required to operate above 9 km/h need not be so biased. (See Point 11.1.2.1.).
- 11.2.2.4. Brakes may be power assisted, but it shall be possible to obtain the minimum braking specified in Point 10.3.4.1. c) in the absence of the brake power assistance source.

11.2.3. Operating position

- 11.2.3.1. The operator's position on trucks designed to operate above 1.2 m shall be provided with guard rails in accordance with the requirements laid down in Point 10.10.3.4.
- 11.2.3.2. Gates, doors, etc. shall be capable of opening only inwards, upwards and sideways, and should preferably be self closing. When the truck is designed to elevate the operator's position above 1.2 m, the gates, doors, etc. shall have a mechanism that prevents traction and elevation movements when the gates, doors etc. are not properly in place.
- 11.2.3.3. In "walk-on" type order picking trucks where a pallet etc., may be used as a walking surface, means shall be provided to prevent its inadvertent displacement. In addition, "walk-on" type order picking trucks elevating above 1.2 m from the ground shall be provided with means to prevent the operator falling from the platform when the pallet is not in place.
- 11.2.3.4. For "walk-on" type order picking trucks (Point 11.2.3.3.) where the operator position may be raised to heights of more than 1.2 m, the guard rails specified in Point 11.2.3.1. shall be extended to encompass the whole of the area accessible to the operator (and assistant if permitted by the design).
- 11.2.3.5. Where the enclosure of the operator position is such that an operator could become trapped, either the doors shall be designed to facilitate release from the outside or an alternative means of egress/access, such as a roof trap door, shall be provided.

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11.2.3.6. The floor of the operator's platform shall approximately horizontal, slip resistant and, if primarily for outside use, designed to prevent the accumulation of water.

It shall be capable of withstanding a pressure of 1800 N/m^2 and a mass of 100 kg distributed over an area of 0.16 m^2 at any part of its surface.

Where the floor is provided with glazing, it shall be of equivalent strength to the floor or be protected to a standard at least equivalent to the floor.

Where grated flooring is used, the holes or openings shall not allow a 20 mm diameter sphere to pass through. The section of each opening shall in no case exceed 400 mm^2 .

11.2.3.7. The materials used in the construction of the operator position shall be difficult to ignite.

11.2.3.8. Where the sides of the operator's platform are fitted with glazing, the protection specified in Point 11.2.3.1. shall be extended across the glazing as appropriate.

11.2.4. Overhead guard

An overhead guard meeting the requirements of Point 10.10.1. shall be fitted above the operating position. Alternatively, the requirement contained in Point 10.10.1.3.2. may be waived if an elevating arresting device is fitted on top of the overhead guard or on the roof of the cabin. On hydraulic lifting mechanisms the pressure limiter may be used for this purpose if the overhead guard is of an adequate strength.

11.2.5. Safety devices and constructional details

11.2.5.1. A device or devices shall be fitted, or the controls so arranged to ensure that the operator (and his assistant if permitted by the design) (see Note 1) are safely within the confines of the cabin or platform before any movements of the truck or platform can be initiated by the operator, and also to ensure that he/they cannot reasonably extend beyond the confines of the cabin or platform without cancelling truck movements.

Note 1:

Where an order picking truck is fitted with multiple manning security devices, a lock-out master switch may be fitted to permit variations of the manning team. The switch shall be lockable by a key different to any other used on the truck.

../..

11.2.5.2. Where the operator elevating mechanism employs wire-ropes or chains, a slack wire-rope or chain detecting device shall be fitted which automatically suspends the downward motion of the elevating mechanism of the operating position until fault conditions are corrected and the detecting/safety mechanism is reset.

The elevating mechanism shall be arranged to prevent wire-ropes becoming entangled, twisted and displaced from their normal operating position.

11.2.5.3. The aggregate breakingload of the set of chains or wire-ropes, as certified by the chain or wire-rope manufacturer, shall be at least for chains 10 times and for wire-ropes 12 times the static operating load supported by all the chains or wire-ropes together.

11.2.5.4. Safety of lifting equipment

11.2.5.4.1. The truck shall be equipped with a device to prevent the operating position plummeting in the event of a breakdown or malfunction of the lifting system.

11.2.5.4.2. The requirements of 11.2.5.4.1. are considered to be fulfilled if one of the following precautions are taken:

11.2.5.4.2.1. - there is a catching mechanism provided;

- if at least one chain or one wire-rope is used to ensure operation of the catching mechanism. This (these) shall comply with the requirements of Points 10.8.1.1. and 10.8.1.2. respectively.

These shall be in a no-load condition during normal operating conditions. The attachment point(s) shall be so designed as to be compatible with the shock of the safety device coming into action.

It shall not be possible for the operator to disengage this mechanism unless the descent rate is limited to 0.6 m/s.

11.2.5.4.2.2. Fully hydraulic lifting equipment

A device shall be provided which prevents descent in the event of a pipe fracturing or a hose bursting. This device shall be either attached to or incorporated in the lift cylinder.

11.2.5.4.2.3. Combined lifting systems (hydraulic and mechanical)

- the devices mentioned in Point 11.2.5.4.2.2. shall be applied to the hydraulic lifting mechanism.

- the mechanical lifting system shall have at least 2 identical chains or wire-ropes whose safety factor shall comply with the requirements of Point 11.2.5.3.

The load shall be uniformly distributed between the chains or the wire-ropes.

All effective steps shall be taken to ensure that in the event of breakage of one or more chains or wire-ropes the arrangement of the chain(s) or wire-rope(s) and their anchorages remaining in use should be maintained without bringing about any deformation of the basic components of the appliance. The breakage of one chain or wire-rope shall cause stopping of the movement which is taking place.

- 11.2.5.5. Where two control positions are embodied, one on the elevating section and one on the fixed section, it shall be necessary to prevent actuation of the fixed section controls before the elevating section controls are operative. However, the emergency lowering requirements specified in Point 11.2.5.8. shall still be applicable.
- The fixed section control position shall be located clear of the area occupied by the elevating section control position when lowered.
- 11.2.5.6. The energy source (normally the battery) shall be capable of being reliably disconnected from the truck traction, lifting and load manoeuvring systems by a means within easy reach of the operator regardless of the position of the operating cabin/head.
- The system shall be so designed that no danger will result from interruption of the power supply during descent.
- 11.2.5.7. Trucks that are designed to elevate the operator position above 2.5 m shall be provided with means by which the operator can reach the ground safely in the event of the operator position becoming fixed in the elevated position.
- 11.2.5.8. Trucks designed to elevate the operator position above 2.5 m shall be fitted with an emergency lowering control, operable from ground level even in the absence of any energy source. The control position shall be carefully selected so as to avoid any risk to the person who is operating from this position.
- 11.2.5.9. The lifting mechanisms shall be provided with travel limiting devices. One of these devices shall be an obligatory mechanical stop which prevents the lifting mechanism becoming disengaged at the top of its travel.
- Means shall also be provided to prevent the operator's position being accidentally disengaged from the lifting mechanism over the complete range of its movements.
- 11.2.5.10. Trucks with an operator position designed to elevate above 2.5 m shall be fitted with a warning light visible from ground level when the truck is lowering and travelling.

11.2.5.11. Trucks equipped with pneumatic tyres shall be fitted with a device or devices that minimize inclination and prevent loss of stability in the case of tyre failure.

11.2.6. Information plates

11.2.6.1. The capacity plate (Point 10.1.2.) shall clearly indicate not only the capacity/height relationships but also heights at which brake draw-bar drag changes are automatically imposed.

The capacity plate shall be permanently fixed and be clearly readable by the operator in his driving position.

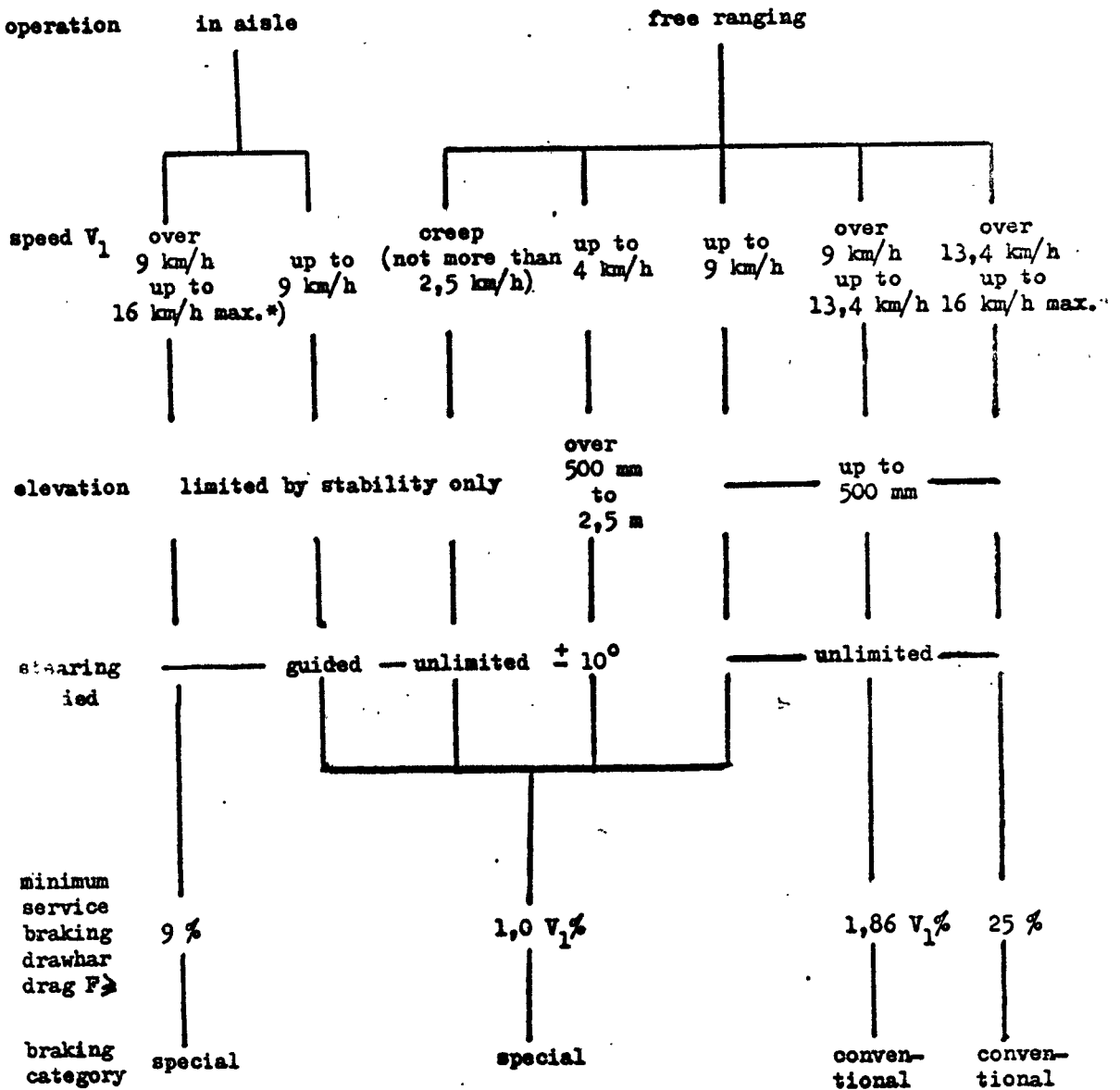
11.2.6.2. In addition to the labelling requirements in Point 10.1. and elsewhere, the truck shall be fitted with a permanently fixed label clearly indicating the number of persons permitted on the operator's platform, while the truck is in use.

12. Documentation - operating and servicing instructions

Each powered industrial truck (or by agreement of the user, each group of trucks) shall be accompanied by a book (or books) detailing full operating and servicing instructions.

The documentation need not necessarily be supplied at the same time as the truck.

FIGURE 1



*) for non-elevating seated operator the 16 km/h maximum speed does not apply

Addendum A

Definition of capacity

1. Introduction

This Addendum defines Rated Capacity which facilitates the comparison of manufacturer's basic models; this rated capacity is related to a standardized lift height.

It also defines the Actual Capacity which relates to the rating of a truck when fitted with its operational mast; this actual capacity is derived from the relevant standard stability tests.

2. Rated Capacity

The manufacturer's Rated Capacity of a truck shall correspond to the maximum load Q (see note 1) which it is designed to carry and stack, on fork arms or platform, with a vertical double mast the maximum lift height of which is equal to the Standard Lift Height H , as specified in Point 3, and with a Standard Load Centre Distance D , as specified in Point 4, measured horizontally and vertically between the centre of gravity G of the load and:

- a) the front face of the fork shank
 - b) the upper face of the fork blade (see fig. 1)
- (or equivalent dimensions in the case of trucks fitted with a platform

Note 1: When a truck embodies facilities for an elevated operator an allowance of 90 kg shall be included in addition to the rated load Q .

Even if the truck does not utilize a double mast or does not lift to the standard Lift Height H it shall still be given a Rated Capacity as if the mast was available.

D = Standard Load Centre Distance
 G = Load centre of gravity, positioned in the longitudinal plane of symmetry between the mast uprights

H = Standard Lift Height

Q = Load

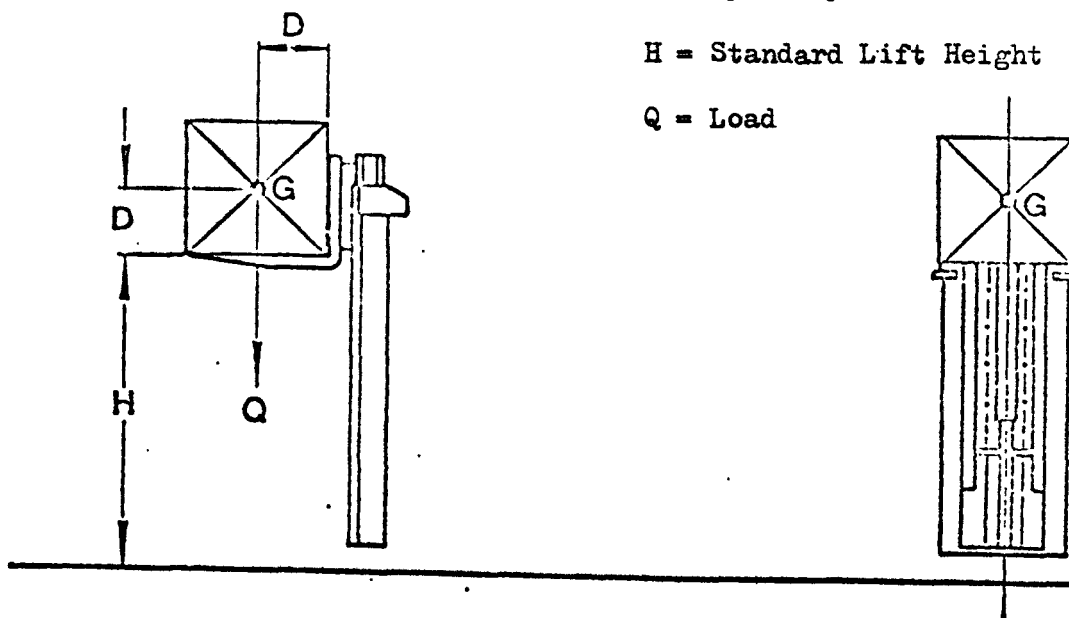


Figure 1

3. Standardized Lift Heights

The Standardized Lift Height is fixed as follows:

H = 2.5 m for pallet stackers and high lift platform trucks having a width across fork arms or platform up to and including 690 mm

H = 3.3 m for all other types of trucks.

4. Standardized Load Centre Distance

4.1. For series-produced counter-balanced trucks up to a capacity of 10,000 kg delivered to countries using the international unit System (SI) the Standardized Load Centre Distances used for rating shall be the following:

Load Q	Standardized Distances D
up to but excluding 1,000 kg	400 mm
from and including 1,000 kg up to but excluding 5,000 kg	500 mm
from and including 5,000 kg up to and including 10,000 kg	600 mm

- For all other trucks except side loading fork lift trucks, the Standard Load Centre Distance used for rating shall be 600 mm.
- Side loading fork lift trucks shall be rated at a load centre distance specified by the manufacturer.
- It is permissible to rate trucks for special applications with load centre distances related to the application.

5. Actual Capacity

The Actual Capacity of a truck is derived from the appropriate stability tests and will vary with the different types and heights of mast fitted, the different load centre distances (see Point 4) used in rating. The Actual Capacity shall be determined with standard fork arms or platform. Additional Actual Capacity ratings with removable attachments may also be established where permitted by the appropriate stability specification.

Addendum B

Capacity plate data

1. Introduction

This Addendum is to facilitate the uniform provision of information on capacity plates.

The derivation of the capacity data is covered in Addendum A.

2. Rated Capacity

The Rated Capacity may be shown on the capacity plate and/or the identification plate.

When shown on the capacity plate the rating shall be in kilograms and shall be entered in such a way that it is not confused with the Actual Capacity entries.

e.g. "Rated Capacity = 6,000 kg".

When shown on the identification plate it may form part of the manufacturer's model designation and may be expressed in tonnes or kilograms.

e.g. Model No: XYZ/6.0

3. Actual Capacity

The Actual Capacities, lift heights and load centre distances to be shown on the capacity plate shall comply with the following requirements:

3.1. The Actual Capacity at the truck maximum lift height and the Standardized Load Centre Distance shall always be shown.

Actual capacities of one or more other load centre distances shall also be shown if the truck design permits (see Note 1)

3.2. When it is permissible to lift Actual Capacities greater than those in Point 3.1. to truck lift heights less than the maximum, these shall be shown at the associated lift heights and Standardized Load Centre Distance.

Actual Capacities at one or more other load centre distances shall also be shown if the truck design permits (see Note 1).

3.3. For special applications other Actual Capacities and load centre distances may also be shown.

Note 1: The additional load centre distance(s) shall preferably be Standardized Load Centre Distances and for trucks delivered in countries using SI units, one of these distances, if not already included, shall be 600 mm.

4. Attachments

When a truck is fitted with one or more removable load handling attachments as original equipment, the truck shall carry capacity information additional to that required in Point 3. The Actual Capacities, lift heights and load centre distances with each attachment fitted shall be shown as follows:

- 4.1. The Actual Capacities at the truck maximum lift height (if the truck design permits, otherwise at the maximum permitted lift height) and the designed load centre distances shall always be shown.
- 4.2. When it is permissible to lift Actual Capacities greater than those in Point 4.1. to truck lift heights less than the maximum, these shall be shown at their associated lift heights and designed load centre distance(s).

In addition, the capacity plate shall clearly identify the attachment to which the ratings apply.

5. Units

The units used to express the ratings shall be:

SI

Lift height	Millimetres (mm)
Load	Kilograms (kg)
Load Centre distance	Millimetres (mm)

6. Marking

The details entered on the capacity plate may be in the form of a table or diagram.

Addendum C

Specification of connectors

1. SPECIFICATION

1.1. Number of models

This specification applies to three models, defined by their nominal current in amperes: 80 - 160 - 320 amperes.

1.2. Definitions

1.2.1. Nominal current

The nominal current is the current in amperes that the connector is able to carry continuously without exceeding the allowable temperature rise indicated in Point 1.3.8.

1.2.2. Emergency current

The connector is not meant to break a current during normal use. The emergency current is the maximum current that the connector is able to break in case of a disconnection necessitated by exceptional or dangerous circumstances.

1.2.3. Voltages

1.2.3.1. Maximum voltage

The connectors shall be capable of being operated up to a maximum voltage of 150 volts, direct current; the maximum voltage shall be marked on the outside of the connector (see 1.3.11.).

1.2.3.2. Operating voltages

The nominal voltages of traction batteries shall not exceed 96 volts.

1.3. Manufacturing details

Each connector shall comprise two connectable halves. Each half shall be capable of being fitted with a mounting bracket.

1.3.1. Casings

The casings shall be of adequate mechanical strength, fire resistant, non-absorbant and resistant to acid, battery gas and dilute bases (e.g. salt). They should be able to be coloured in all the normal colours.

1.3.2. Contacts

Each half-connector shall comprise two main contacts. Provision shall also be made for two auxiliary contacts. All these contacts shall be adequately protected against corrosion.

On all three models of connector the auxiliary contacts shall be able to carry a current of 20 amperes. They shall not make contact until after connection of the main contacts.

1.3.3. Mechanical parts

Mechanical parts shall be adequately protected against corrosion.

1.3.4. Non-reversibility

The casings shall have incorporated a non-removable device ensuring the non-reversibility of the two half-connectors to prevent any reversal of polarity.

1.3.5. Insulation

When the two half connectors are separated, the contacts or current carrying parts shall not be able to come in contact with any metallic parts.

The insulation should be capable of withstanding temperatures from + 90°C to - 20°C.

Considering that the maximum temperature should not exceed 90° C , the internal and external insulating materials can be chosen from class Y or higher, of recommendation n° 85 of the International Electrotechnical Commission (1957).

1.3.6. Degrees of protection

1.3.6.1. When the two half-connectors are coupled:

- the assembly shall be protected against accidental contact of persons with live parts and against the introduction of middle-sized foreign bodies.
- the assembly shall be protected against the introduction of liquids, when this assembly is tested in its normal operating attitude.

1.3.6.2. The half-connector connected permanently to the battery shall be protected against the accidental contact of persons with live parts and against the introduction of middle-sized foreign bodies.

These various protections shall conform to the degree of protection of CENELEC publication HD 365, namely:

- IP 2* - Protection against the contact of fingers with live parts. Protection against the penetration of middle-sized foreign bodies.
- IP *3 - Water falling in rain at an angle equal to or smaller than 60° (about 1 rad) with respect to the vertical shall have no harmful effect.

1.3.7. Coding

Each connector shall be arranged to be fitted, if needed, with coding means preventing the connection of a male half connector with a female half-connector meant to operate on another voltage.

1.3.8. Temperature rise

The contacts, cable connecting parts, casings and mechanical parts, shall be able to withstand a maximum temperature of 90°C i.e. a temperature rise of 65°C above an ambient temperature of 25°C. The final temperature should never exceed 90°C in cases of special operating conditions such as higher ambient temperatures, use of cables of smaller section, etc..

They should also be able to withstand a minimum temperature of - 20°C.

1.3.9. Cables

The two half-connectors should be connected to the battery and to the truck equipment (or to charging circuits) by cables.

The following table indicates, for the three models of connectors, the maximum section of copper cables.

Nominal current in amperes:	<u>80</u>	<u>160</u>	<u>320</u>
Maximum cable section in mm ² :	16	35	95

Note: variations may be required if aluminium cables are used.

1.3.10. Locking - Manoeuvrability

Any two half-connectors when joined shall be capable of being secured together by a locking device. This device shall be capable of being unlocked quickly in case of emergency.

The two half connectors shall be able to be separated easily in any position; one section of the locking device to be fully dimensioned to ensure complete interchangeability between designs. A grip may be devised to allow connection or disconnection. This grip may be combined with the locking device.

1.3.11. Marking

All connectors shall bear legibly and indelibly the following marks:

- manufacturers name or trade mark
- maximum operating voltage: i.e. 150 V
- nominal current in amperes (eg. 160 A)
- the signs "+" and "-" corresponding to the contacts to be connected with the positive and negative poles of the battery.

2. TESTS ON PROTOTYPES

The following tests shall be carried out on the prototypes of the three models of connectors. Mass-produced connectors shall be guaranteed as being able to pass the same tests.

2.1. Temperature tests

The connector shall be connected by means of cables of the maximum allowable section. Cables shall be connected by one of the methods recommended by the connector manufacturer.

They should have a length of 2 meters.

Tests shall be carried out under nominal current.

The test shall continue until temperatures are stable.

The rise in temperature shall be measured with thermocouples or by other methods of equivalent precision. The use of ordinary thermometers is prohibited.

Temperatures and temperature rise shall not exceed the values mentioned in Point 1.3.8.

Temperature rises with cables of lower sections may be quoted.

2.2. Life test

Two half-connectors being normally coupled, without current, shall be separated, then coupled again.

This test shall be repeated 5000 times. After this test, the connector shall be able to pass the temperature tests described in 2.1.

2.3. Test of disconnection under load

2.3.1. Test of disconnection in overload conditions

An assembly of two coupled half-connectors shall be connected to a source of direct current of 96 volts through a circuit having an inductance of 0.50 ± 0.05 millihenrys.

The connector shall carry the following currents:

- model 80 amperes 200 amperes
- model 160 amperes 400 amperes
- model 320 amperes 800 amperes

After the current is established, it shall be broken by separating the two half connectors.

This test shall be carried out 5 times consecutively.

After this test, the connector shall be inspected for damage, then coupled again and submitted to the temperature test as in Point 2.1.

Failing to be able to couple or to pass the temperature test shall result in rejection.

2.3.2. Test of disconnection under short-circuit conditions

An assembly of two coupled half-connectors shall be connected to a source of direct current through an inductive circuit having an impedance such that the time constant of the circuit is 15 milliseconds and the current to be broken shall be 4 times the nominal current, when connected to a supply voltage of 96 volts.

The connector shall be capable of clearing any arcs which are drawn as a result of this emergency disconnection. It is not imperative that the two halves of the connector should remain serviceable after this test.

2.4. Immersion tests

Two coupled half connectors, without cables, shall be immersed for 4 hours in a solution of sulphuric acid having a specific gravity of 1.10 ± 0.05 at ambient temperature. After rinsing in clear water and drying the two half-connectors should be able to mate correctly and to pass the temperature test as in Point 2.1.

This test shall be repeated in the same conditions, using a solution of potassium hydroxyde (caustic potash) of specific gravity 1.10 ± 0.05 .

The coupled half connectors should be also suspended in hydrogen gas for a period of not less than 48 hours, prior to being subjected to the dropping test (Point 2.6.).

2.5. Dielectric test

Each half connector without cables shall be able to withstand for one minute, a sine-wave alternating current, with a frequency between 25 and 100 hertz and voltage of 2,000 volts rms applied:

- between the two main contacts
- between the auxiliary contacts, if any, and the main contacts
- between all the contacts and the metallic parts of the connectors and the metallic parts fitted on the casing (if this casing is made of insulating material)

2.6. Dropping test

A half connector shall be connected to two lengths of 1.50 m of cable of the maximum allowable section, the ends of which shall be located at 1.00 m above the ground.

The half connector shall be dropped from a height of 2.00 m on to a concrete floor.

This test shall be carried out 25 times.

After these tests, no part of the connector shall show any cracks or permanent deformation.

The half-connector shall be able to mate correctly with another one.

Addendum D

Valid operating conditions for trucks with elevating operator position and trucks specifically designed to travel with elevated loads

1. Valid unrestrained operating conditions for trucks which elevate/orientate the load and/or operator whilst travelling or travel with the load and/or operator elevated are:
 - a) floors smooth and level, to the truck manufacturer's specification, and able to support the mass of the truck, operator and load in operation.
 - b) floors free from foreign bodies and material which could affect the operation/stability of the truck

and when in a guided mode (overturning forces unrestrained):

- c) Guide rails or similar devices which do not permit the longitudinal axis of the truck to deviate from the direction of the aisle by more than 2° .

Operating conditions other than the above shall be agreed between all interested parties.

2. Restrained operation

When a truck is restrained in its operating mode so that all overturning forces are resisted by external means, e.g. by truck rollets running in restraining rails fitted to the racking, the respective special stability tests for operation in the aisle are not necessary. However, the forces generated in operation, as advised by the truck manufacturer, shall be capable of being resisted by the equipment/devices of the static installation, and disengagement of the equipment whilst operating elevated in the aisles shall be prevented.

3. Aisle Clearance

When trucks are operated in their guided mode, the normal aisle safety widths associated with conventional trucks no longer apply.

A N N E X I I

MANUFACTURER'S (OR IMPORTER'S) CERTIFICATE OF CONFORMITY
IN RESPECT OF POWERED INDUSTRIAL TRUCKS

I, the undersigned
(surname and first name)

hereby certify that the powered industrial truck specified hereunder
conforms in all respects to the requirements of the separate Directive
.....
.....

(title and number of Directive)

- 1. Category :
- 2. Manufacturer/Importer :
- 3. Type :
- 4. Type number/serial number
of powered industrial truck:.....
- 5. Year of manufacture :
- 6. Any additional infor-
mation :

Date
(signature)

.....
(position)

A N N E X I I I

Conformity mark



1. The conformity mark shall be clearly visible and indelible. It shall be affixed directly beside or on the descriptive plate.
2. The dimensions of the mark shall be so selected that the information on the mark is clearly legible and visible. The actual diameter of the circle described about the mark shall be at least 15 mm.
3. The upper half of the conformity mark shall contain the Number 3 it being the designed Number of this Directive.

