BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

पावरचालित औद्योगिक ट्रकों की पारिभाषिक शब्दावली
(चौथा पुनरीक्षण)

Draft Indian Standard

POWERED INDUSTRIAL TRUCKS - TERMINOLOGY
(Fourth Revision)

ICS: 53.060

Last date for receipt of comments is 09 July 2024

Transport Tractors, Trailers and Industrial Trucks Sectional Committee, TED 22

FOREWORD

(Formal clause to be added later on)

The object of this standard is to define the various terms used in the classification and characteristics of powered industrial trucks. It is expected that this standard will provide to both the manufacturers and the users of industrial trucks terms in common parlance in this field avoiding ambiguity in interpretation

This standard was first published in 1968 covering definitions of terms relating to powered and non-powered trucks. In 1974, in the first revision, terms relating to powered industrial trucks only were covered and in 1977 additional terms were incorporated.

In 3rd revision, the terms relating to component of trucks, track data, specific operation and safety features have been defined in detail. Some new terms which are relevant to industrial trailers and to operating areas where Slick trucks are expected to be used have also been included in this revision.

This standard is based on ISO 5053: 1987 'Powered industrial trucks - Terminology' issued by the International Organization for Standardization (ISO).

The committee responsible for the preparation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of test or analysis, shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard

POWERED INDUSTRIAL TRUCKS - TERMINOLOGY

(*Fourth Revision*)

1 SCOPE

This standard specifies the various terms used for powered industrial trucks, its components and accessories.

Some terms are not being defined, because they are self-evident or because they are in general use elsewhere such as petrol trucks/diesel trucks.

This standard also defines the terms relating to industrial trailer and operating areas where such trucks are expected to be used (*see* Annex A).

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS No.	*Title*
IS 6839 (Part 1): 1973	Glossary of terms relating to non-Powered materials handling Equipment: Part 1 Castors and wheels.
IS 7451 (Part 1): 1974	Reciprocating internal combustion engines: Part 1 General definitions
IS 7451 (Part 2): 1974	Reciprocating internal combustion engines: Part 2 Definitions of location of an engine
IS 7451 (Part 3): 1974	Reciprocating internal combustion engines: Part 3 Definitions of right-hand and left-hand single bank engines
IS 7451 (Part 4): 1974	Reciprocating internal combustion engines: Part 4 Designation of direction of rotation
IS 7451 (Part 5): 1974	Reciprocating internal combustion engines: Part 5 Designation of the cylinders
IS 7451 (Part 6): 1974	Reciprocating internal combustion engines: Part 6 Hand operated control devices - Standard direction of motion
IS 7570: 1975	Glossary of terms relating to fork arms and attachments of forklift trucks

3 TERMS RELATING TO TRUCKS BY CLASSIFICATION

The terms are defined in order of classification. The classification is based on:

a) Mode of action;
b) Power of source;
c) Mode of control;
d) Height of left; and
e) Mode of travel.

3.1 Classification by Mode of Action

3.1.1 *Fixed Height Load Carrying Truck* (*Fixed Platform Trucks*).

Trucks carrying its load on a non-elevating platform (*see* Fig 1).

3.1.2 *Towing and Pushing Tractor*

3.1.2.1 *Towing tractor*

Industrial truck, travelling on the ground fitted with coupling means, and specially designed to draw vehicles traveling on the ground (*see* fig 2).

3.1.2.2 *Pushing tractor*

Tractor fitted at the front end with a buffer plate and which can also push vehicles travelling on the ground or on railway trucks (*see* Fig. 2).

3.1.3.1 *Stacking high-lift trucks*

Truck fitted with a platform, fork arms or other load handling devices, able to raise a load either palletized tiering and untiering.

a) *Counterbalanced lift truck* — Stacking lift truck fitted with fork arms (which can be replaced by another device) on which the load, either palletized or not, is put in a cantilever position in relation to the front wheels and balanced by the mass of the truck (*see* Fig. 3)

b) *Reach truck* (*with retractable mast or fork arm carriage*) — Stacking lift truck with outriggers which the load can be repositioned by moving the mast or fork arm carriage (*see* Fig. 4)

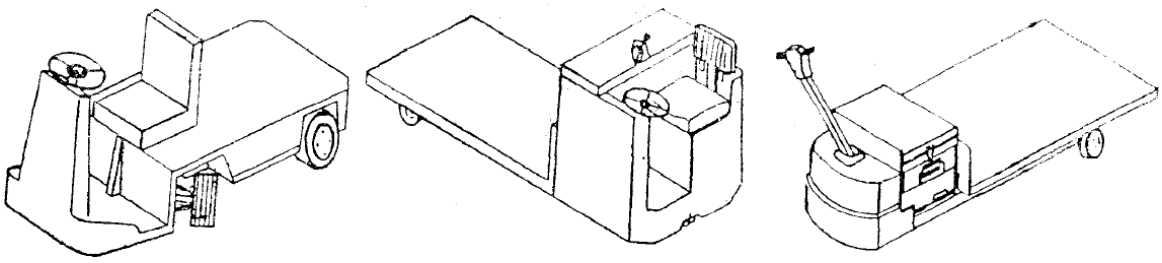


FIG. 1 FIXED HEIGHT LOAD CARRYING TRUCK

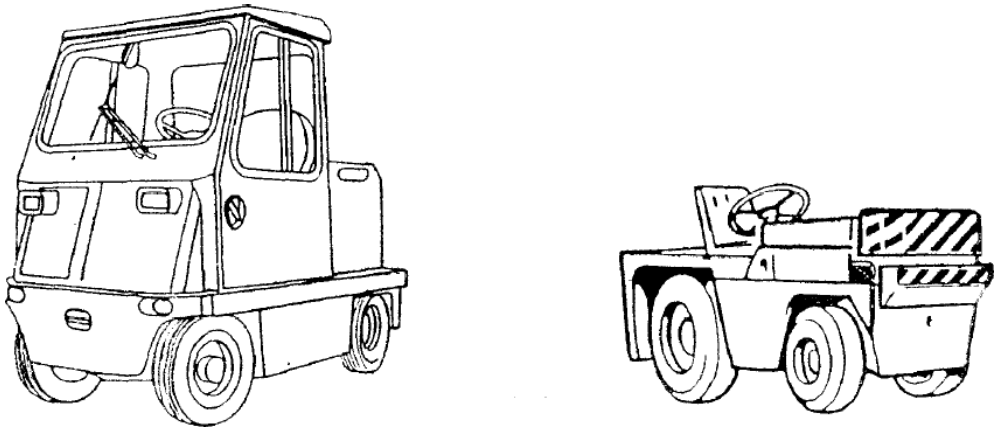


FIG. 2 TOWING AND PUSHING TRUCK

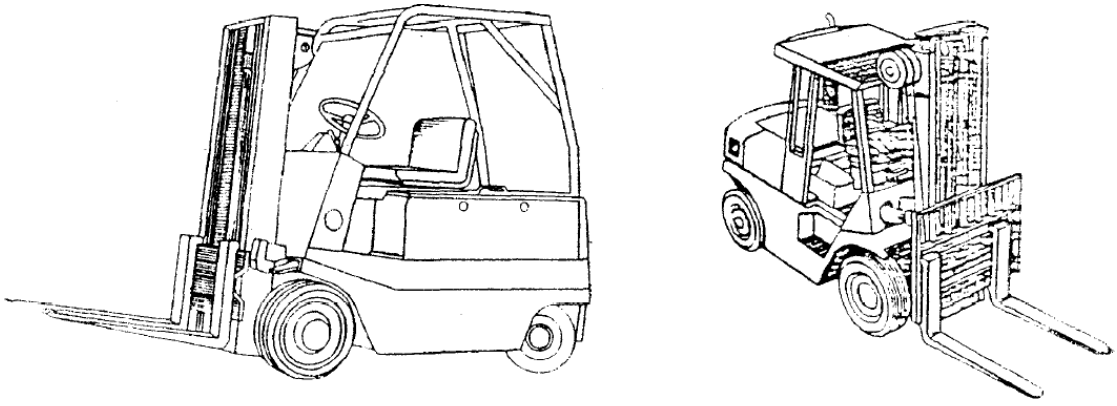


FIG. 3 COUNTERBALANCED LIFT TRUCK

c) *Straddle trucks* - Stacking lift truck with outriggers, fitted with a fork, the arms of which are located between the outriggers and the centre of gravity of the load is always within the stability polygon (*see* Fig. 5).

d) *Pallet stacking truck* - Stacking lift truck where the fork arms extend over the frame structure (*see* Fig. 6).

e) *Platform truck* - Stacking lift truck with a load platform extending over the frame structure (*see* Fig. 7).

f) *Truck with elevatable operating position* - Stacking lift truck, fitted with an operator's platform which can be raised with the load for tiering (*see* Fig. 8).

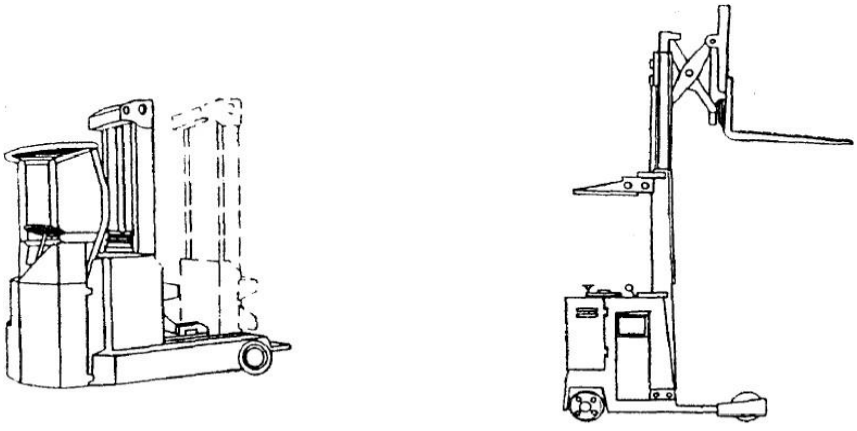
g) *Side-loading truck* (*one side only*) - Lift truck with mast structure or fork arm carrier which can be extended and retracted between the axles and perpendicular to the longitudinal axis of the truck, allowing it to pick up and raise a load in a counterbalanced position in relating to one side of the truck and stack or unstack alongside the truck (*see* Fig. 9).

h) *Rough terrain truck* - Wheeled counter balanced trucks, intended primarily for operation on unimproved natural terrain or disturbed terrain (*see* Fig. 10).

j) *Lateral stacking truck* (*both sides*) - High lift stacking truck capable of stacking and retrieving loads on both sides of the direction of travel (*see* Fig. 11).

k) *Lateral and front stacking truck* - High lift stacking truck capable of stacking and retrieving loads ahead and to both sides of the direction of travel (*see* Fig. 12).

m) *Straddle carrier* (*high-lift type*) *truck* - Lift truck where the frame and lift unit straddle the load to raise, move and stack it (*see* Fig. 13).



A Retractable Mast Truck

B Retractable Fork Arm Truck

FIG. 4 REACH TRUCK

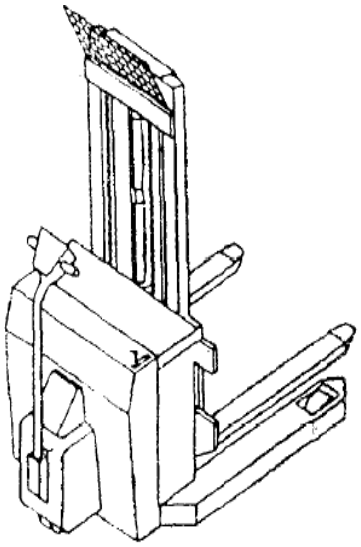


FIG. 5 STRADDLE TRUCK

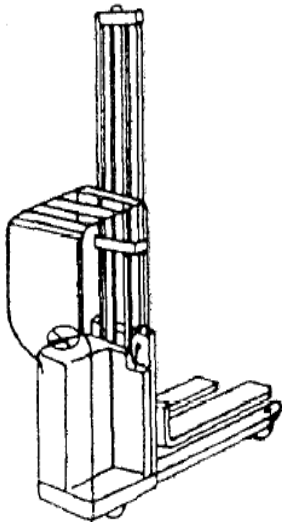


FIG. 6 PALLET STACKING TRUCK

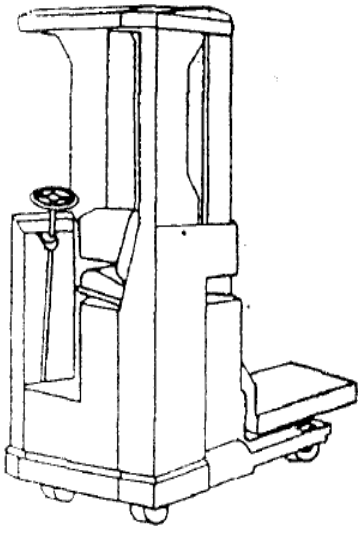


FIG. 7 PLATFORM TRUCK

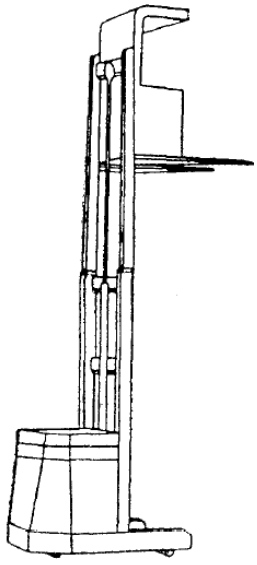


FIG. 8 TRUCK WITH ELEVATABLE OPERATING POSITION

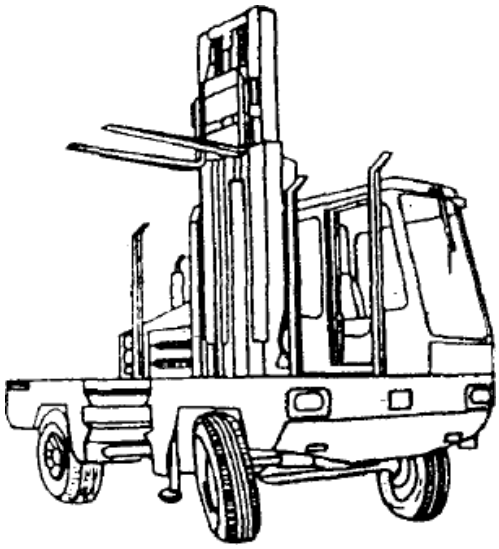


FIG. 9 SIDE-LOADING TRUCK

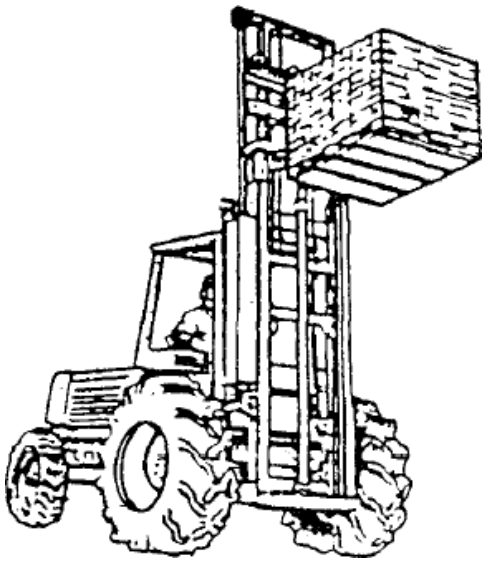


FIG. 10 ROUGH TERRAIN TRUCK

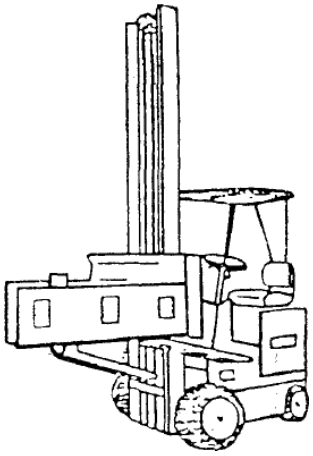


FIG. 11 LATERAL STACKING TRUCK (BOTH SIDES)

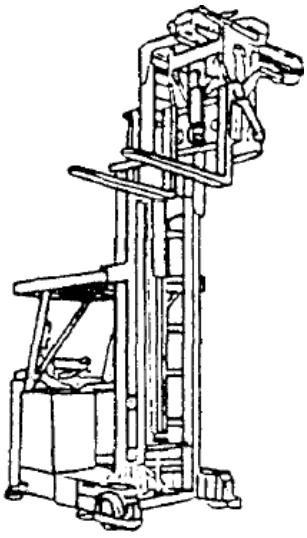


FIG. 12 LATERAL AND FRONT STACKING TRUCK

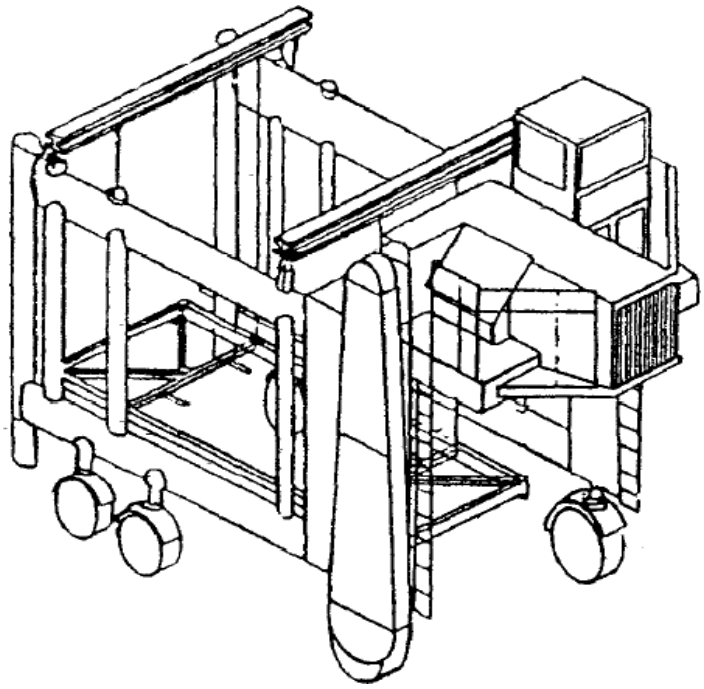


FIG. 13 STRADDLE CARRIER (HIGH-LIFT TYPE) TRUCK

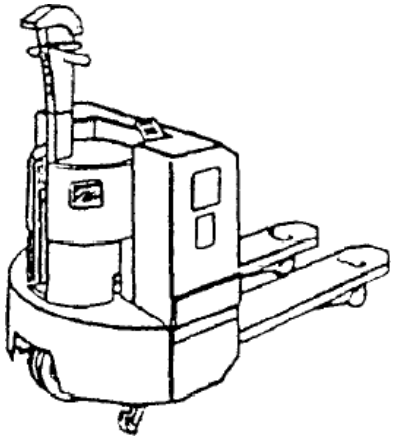


FIG. 14 PALLET TRUCK

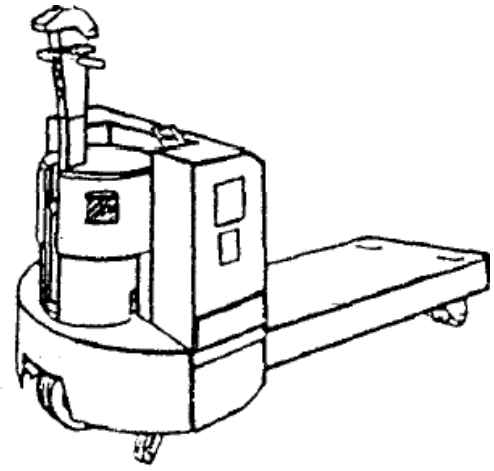


FIG. 15 PLATFORM AND STILLAGE TRUCK

3.1.3.2 *Non-stacking low-lift truck*

Truck fitted with a platform or fork arms and able to raise its load to a height just sufficient to allow its transportation.

a) *Pallet truck* - Pedestrian or rider controlled non-stacking lift truck fitted with form arms (*see* Fig. 14).

b) *Platform and stillage truck* - Pedestrian or rider-controlled non-stacking lift truck fitted with a load carrying platform or structure (*see* Fig. 15)

c) *Straddle carrier (non-stacking type) truck* - Lift truck where the frame and lift unit straddle the load to raise and move it (*see* Fig. 16).

3.1.3.3 *Order picking truck*

Lift truck fitted with an operator's platform which can be raised with the platform or fork arms, allowing the operator to load or unload goods from racking to the load carrying attachment (*see* Fig. 17).

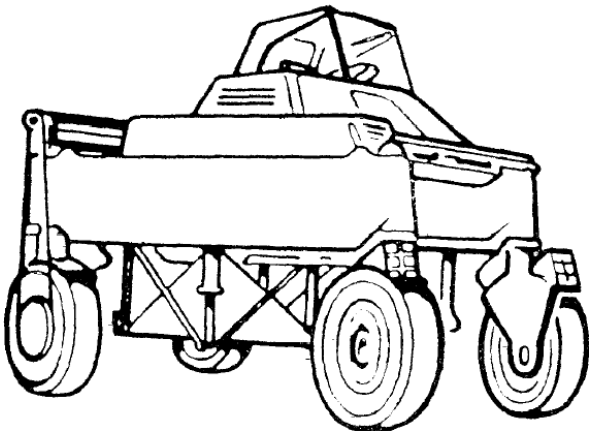
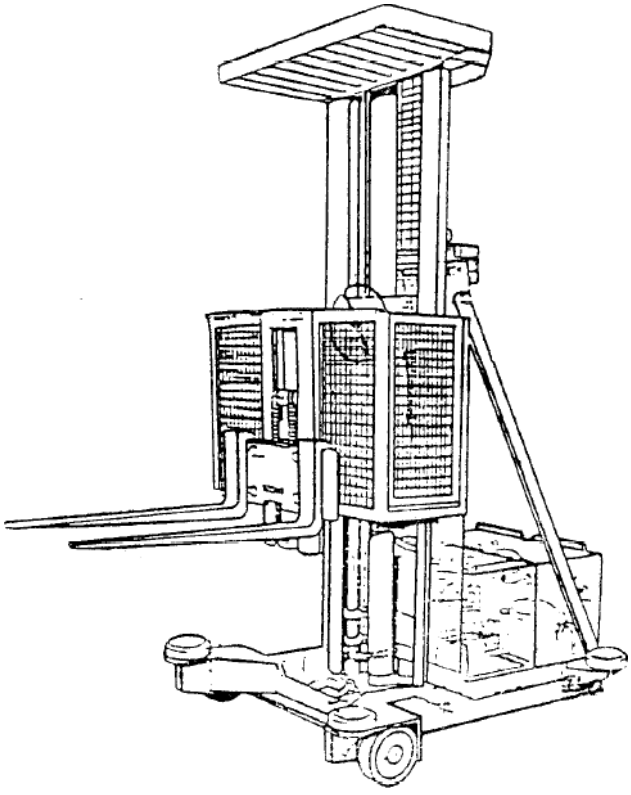


FIG. 16 STRADDLE CARRIER (NON-STACKING TYPE) TRUCK

FIG. 17 ORDER PICKING TRUCK



3.2 Classification by Power Truck

3.2.1 Internal Combustion Truck

a) Petrol truck,
b) Liquefied petroleum gas (LPG) truck,
c) LPG/petrol (gasoline) truck, and
d) Diesel truck.

3.2.2 Electric Truck

a) Storage battery truck; and
b) External source truck.

3.2.3 Internal Combustion, Electric Truck

3.3 Classification by Type of Wheel

a) Wheels with pneumatic tyres
b) Wheels with solid tyres for pneumatic tyre rims,
c) Wheels \with solid tyres, and
d) Wheels with metal rims.

3.4 Classification by Mode of Control

3.4.1 Rider Control Truck

a) Sit-on truck
    i) Facing forward, and
    ii) Other than direction of travel.

b) Stand-on truck
    i) Facing forward, and
    ii) Other than direction of travel.

3.4.2 Pedestrian-Controlled Truck

3.4.3 Driverless Truck

3.5 Classification by Height of Lift

a) Non-lifting truck,
b) Low-lift (non-stacking) truck,
c) Medium-lift (stacking and non-stacking)
d) High-lift (stacking and non-stacking) truck.

3.6 Classification by Mode of Travel

3.6.1 *Free Travel*

3.6.1.1 *Uni-directional*

Movement in either direction on a line parallel with its longitudinal axis.

3.6.1.2 *Bi-directional*

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

3.6.1.3 *Multi-directional*

Movement in any direction relative to its longitudinal axis.

3.6.2 *Guided Travel*

Movement on a line defined by external means.

3.6.3 *Dual-purpose*

Movement in any direction and optional guided travel.

4 TERMS RELATING TO COMPONENT INDUSTRIAL TRUCKS

4.1 Chassis and Associated Components

4.1.1 *Chassis*

Main frame structure to which the various units of the truck, that is engine, transmission, lifting gear, are fixed (*see* Fig.18).

4.1.2 *Counterweight*

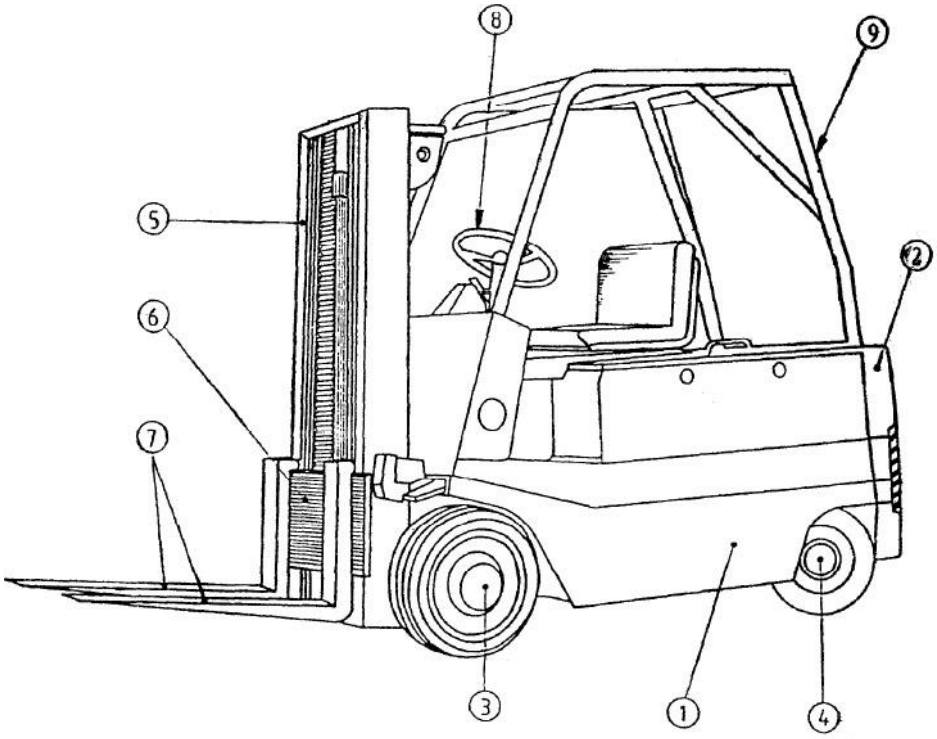
Mass fixed to the chassis intended to counter balance the load (*see* Fig. 18).

4.1.3 *Ballast Containers*

Containers which, when filled with ballast, act as counterweights.

4.1.4 *Auxiliary Ballast Weights*

Additional masses fixed to the chassis of the truck.



Ref. No.	*Terms*
1.	*Chassis*
2.	*Counterweight*
3.	*Drive axle*
4.	*Steer axle*
5.	*Mast*
6.	*Fork arm carrier*
7.	*Fork arms*
8.	*Steering wheel*
9.	*Overhead guard*

FIG. 18 CHASSIS AND ASSOCIATED COMPONENTS

4.1.5 *Bodywork*

Protective or styling panels fitted to the body.

4.1.6 *Operator's Position*

Place for the operator and all the various operating controls.

4.1.1 *Stabilizers*

Movable components, generally in pairs, for maintaining the stability of a truck during stacking operations.

4.2 Axles

Axles are classified as follows:

a) Drive axle (*see* Fig. 18),
b) Steer axle (*see* Fig. 18),
c) Drive-steer axle, and
d) Load axle.

4.3 Driving and Steering Unit

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

4.4 Wheels [*see* IS 6839 **(**Part 1): 1973]

4.4.1 *Function of Wheels*

Function of wheels are as follows:

i) Drive,
ii) Steer,
iii) Drive-steer,
iv) Load, and
v) Guide wheels.

4.4.1.2 *Stabilizer wheels*

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

4.4.2 *Arrangement of Wheels*

a) Number of wheels at any mounting
    i) Single wheels
    ii) Twin Wheels
    iii) Multiple wheels

b) Mounting of wheels
    i) Cantilever wheels

ii) Fork wheels

4.4.3 *Construction of Wheels*

a) Wheel made from only one material (monoblock, for example metal, plastics, rubber);
b) Bonded tyre wheel
c) Pressed-on tyre wheel;
d) Split rim for removable solid tyres, flat base;
e) Split rim for removable solid tyres, conical base; and
f) Wheels for pneumatic tyres and pneumatic solid tyres, for pneumatic tyrerims.

4.4.4 *Suspension Mountings*

a) Articulated wheels,
b) Spring-loaded wheels,
c) Bogie wheels, and
d) Tandem wheels.

4.5 Other Means of Support

4.6 Power Units

a) Electric motor,
b) Internal combustion engine [see IS 7451 (Parts I to 6): 1974],
c) Petrol engine,
d) Liquefied petroleum gas (LPG) engine.
e) LPG/petrol engine,
f) Diesel engine, and
g) Dual fuel engine.

4.7 Transmission Systems

4.1.1 *Hydraulic Transmission*

4.7.1.1 *Hydrodynamic transmission*

A system in which the torque from the power unit IS transmitted by a hydraulic impeller and turbine.

4.7.1.2 Hydrostatic Transmission

A system in which torque from the power unit is transmitted by means of positive displacement hydraulic pump(s) and one (or several) motor(s).

4.7.2 Mechanical Transmission

A system in which the torque from the power unit is transmitted by direct means, that is gear, chain or belt with or without a clutch.

4.7.3 Electrical Transmission

A system in which torque from the power unit is transmitted by means of an electric generator and one or several motor(s).

4.8 Electrical Equipment

4.8.1 Electric Trucks

a) Traction battery;
b) Charging set (built-in or not); and
c) Control devices (controllers, contractors, resistances, electronic control systems).

4.8.2 Engine-Powered Trucks

a) Starter battery;
b) Charging equipment (dynamo, alternator etc); and
c) Starter motor.

4.8 *Ancillary Electrical Equipment* (*for All Types of Trucks*)

a) Lighting
   i) Driving lights (obligatory)
   ii) Working lights

b) Instruments
   i) Recording (ampere/hour meter, time recorder, etc.)
   ii) Indicating (fuel, temperature, battery discharge, etc.)

c) Accessories (connectors, wires, etc.)

4.9 Fuel Supply System for IC Engine

a) Supply system for petrol (gasoline)
b) Supply system for diesel
c) Supply system for liquefied petroleum gas (LPG)

   i) Removable container
   ii) Fixed container with filling valve
   iii) Pressure reducer

iv) Gas-air mixer (vaporizer)
v) Valves
vi) Safety-valves
vii) Piping

4.10 Steering System

a) Control elements

i) Wheel (*see* Fig. 18)
ii) Lever
iii) Tiller
iv) Oscillating platform

b) Types of system

i) Mechanical system
ii) Hydraulic system
iii) Pneumatic system
iv) Electric system
v) Composite system

c) Types of control

i) Manual control
ii) Power assisted control
iii) Fully assisted control

4.11 Braking System

a) Types of brakes

i) Service brake
ii) Parking (or immobilizing) brake
iii) Emergency brake

b) Types of system

i) Mechanical system
ii) Hydraulic system
iii) Electric system
iv) Pneumatic system
v) Composite (or power assisted) system
vi) Power reversal

c) Types of control

i) Mechanical control
ii) Power assisted control
iii) Fully powered control

4.12 Load Bearing Attachments

4.12.1 *Fork Arms* (*see* Fig. 18)

a) Hook mounted fork arms (*see* IS 7570: 1975),
b) Shaft mounted fork arms,
c) Bolted fork arms,
d) Special (rotating, folding, etc.) fork arms, and
e) Extension for the fork arms.

4.12.2 *Load Platform*

a) Fixed load platform,
b) Elevating load platform, and
c) Tipping load platform.

4.12.3 *Other Attachments*

4.12.3.1 *Types of attachments*

a) Attachment fixed with respect to the form carrier (crane arm, boom, etc.) or with respect to the chassis (container, tank, etc.)

b) Load bearing attachment or part, movable with respect to the fork carrier (fork truck) or with respect to the chassis (other trucks)

i) Mechanical attachment (drop bottom container, scoop, etc.)
ii) Hydraulic attachment (clamp, side shift, rotating head, etc.)
iii) Pneumatic attachment (vacuum, etc.)
iv) Electric attachment (electro-magnet, etc.)

4.12.3.2 *Modes of action of equipment*

a) Simple clamping device for engaging the load (for example stabilizer, squeeze clamp attachment)

b) Simple equipment for engaging and imparting movement to the load (for example side shift, push-pull, rotating head)

c) Multiple equipment (rotating clamp, etc.)

4.13 Components Associated with Movement of the Load (Excluding Travel)

4.13.1 Common Components

a) Motor or engine, and
b) Hydraulic components (pump, control valve, piping and accessories).

4.13.2 Lifting Assembly

4.13.2.1 Mast

A fixed upright in which the load carrier or one of several moving uprights slide (*see* Fig. 18).

a) *Non-telescopic (simple) mast* - Mast composed only of a single pair of uprights.

b) *Telescopic mast* - Mast composed or a fixed pair of uprights, and one or more moving upright.

i) *Double mast* (*simple telescopic*) -Mast composed of one fixed and one moving upright.
ii) *Triple mast* - Mast composed of one fixed upright and two moving uprights.
iii) *Quadruple mast* - Mast composed of one fixed upright and three moving uprights.

c) *Lifting jack* **-** One or more lifting jacks (hydraulic cylinders) lifting either through chains or cables, or directly on the load carrier (or load platform) on the moving uprights.

.

i) *Simple lifting jack* - Jack with single ram used for the elevation of the load.
ii) *Compound lifting jack* - Jack with more than one ram arranged concentrically, which are raised one after the other.

d) *Lifting chain* (*or cable*)

4.13.2.2 Articulated arms

a) *Linkage system* - Lifting mechanism with longitudinal articulating arms, usually actuated by hydraulic jacks, to orientate the load carrier (*see* Fig. 19).

b) *Telescopic system* - Lifting mechanism with a longitudinal telescopic and elevating arm, usually activated by hydraulic jacks, to orientate the load carrier (*see* Fig. 20).

c) Control jacks

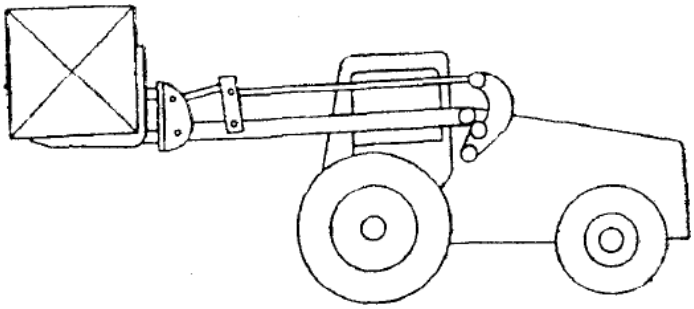


FIG. 19 LINKAGE SYSTEM

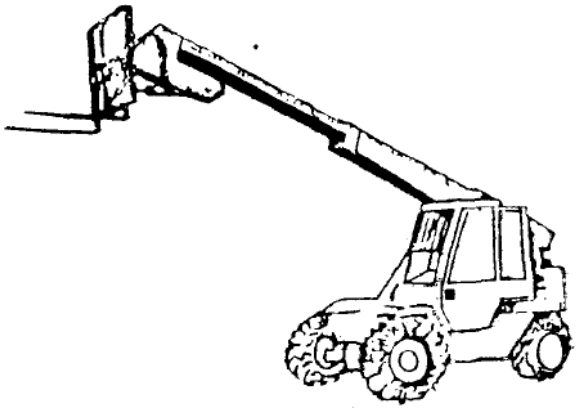


FIG. 20 TELESCOPIC SYSTEM

4.13.2.3 *Other Components*

a) Fork arm carrier - Component sliding on the fixed upright m the case of a non telescopic mast or on the last moving upright in the case of a telescopic mast and bearing the load carrying means (*see* Fig. 18);
b) Fork arm (or other attachments);
c) Tilting system; and
d) Reach system.

4.13.3 *Other Lifting Systems* (*for example cranes on fixed height load carrying trucks*)

a) Screw lifting system, and
b) Winch lifting system.

5 TERMS RELATING TO INDUSTRIAL TRUCK DATA

5.1 Service Mass

Mass of a complete truck with its accessories and ready for use, that is full fuel tank for internal combustion engine trucks, traction battery for electric storage battery trucks, the truck being unladen and without driver.

5.2 Shipping Mass

Mass of the truck with its accessories, but with no source of energy on the truck, that is without fuel or traction battery.

NOTE — The word without fuel' should be understood as follows:

a) For petrol, diesel or LPG trucks with n fixed container: with empty container;
b) For LPG trucks with a semi-fixed container: with empty container; and
c) For LPG trucks with a removable container: without container

5.3 Mass of the Traction Battery Unit

Mass of the battery unit, that is battery, container and ballast, if any.

5.4 Load Per Axle (Front, Rear) of the Truck in Working Order, Unladen

5.5 Load Per Axle (Front, Rear) of the Truck in Working Order with its Rated Load

5.6 Load Per Wheel (Front, Rear) of the Truck in Working Order, Unladen

5.7 Load Per Wheel (Front, Rear) of the Truck in Working Order, with its Rated Load

5.8 Truck

a) Front (*see* Fig. 21), and
b) Rear (*see* Fig. 21).

5.9 Wheel Base (*see* Fig. 21)

5.10 Rated Capacity and Load Diagram

5.11 Load Centre Distance

5.12 Overall Dimensions

a) Heights
   i) Height, mast retracted (*see* Fig. 21)
   ii) Height, mast extended (*see* Fig. 21)

iii) Height of overhead guard or over cab (*see* Fig. 21)

b) Length without fork arms (*see* Fig. 21)
c) Width (*see* Fig. 21)

5.13 Free Lift Height

Maximum height of the fork without extending the telescopic mast above the fixed mast (*see* Fig. 21).

5.14 Maximum Lift Height at Rated Load

5.15 Overall Maximum Lift Height (*see* Fig. 21)

5.16 Overhead

a) Front overhang (*see* Fig. 21),
b) Rear overhang (*see* Fig. 21), and
c) Lateral overhang.

5.17 Ground Clearance Under Mast (*see* Fig. 21)

5.18 Ground Clearance at Centre of Wheel-Base (*see* Fig. 21 and 22)

5.19 Ramp Angles

5.20 Minimum Outside Turning

5.21 Width of Theoretical Minimum Intersecting Aisle (With and Without Load) (*see* Fig. 21)

5.22 Width **of Theoretical Minimum Aisle for Right Angle Stacking (With or Without Load) (for a Given Pallet) (set Fig. 21)**

5.23 Drawbar Pull

5.24 Maximum Negotiable Gradient

a) Laden, and
b) Unladen.

5.25 Maximum Tilt of the Mast or for Carriage

a) Maximum tilt forward (*see* Fig. 21), and
b) Maximum tilt backward (*see* Fig. 21).

5.26 Maximum Travel Speed on the Level (With and Without Load)

5.27 Stopping Distance

5.28 Maximum Lift Speed (With and Without Load)

5-29 Maximum Lowering Speed (With and Without Load)

6 TERMS RELATING TO SPECIFIC OPERATIONS

6.1 Engaging and Disengaging the Load

a) Engaging and raising the load, and
b) Lowering and disengaging the load.

6.2 Lifting and Lowering the Load

a) Lifting the load, and
b) Lowering the load.

6.3 Stacking/unstacking

6.3.1 *Stacking*

Handling consisting of lifting a load, and placing it on a stack composed of similar loads.

6.3.2 *Unstacking*

Removing a load from the top most position in a stack and lowering.

6.4 Tiering/Untiering

6.4.1 *Tiering*

Handling consisting of lifting a load from a rack or shelf in a storage system.

6.4.2 *Untiering*

Handling consisting of lifting a load from a rack or shelf and lowering.

6.5 Tilting the Mast (or Fork Arms)

a) Forward tilt, and
b) Backward Tilt.

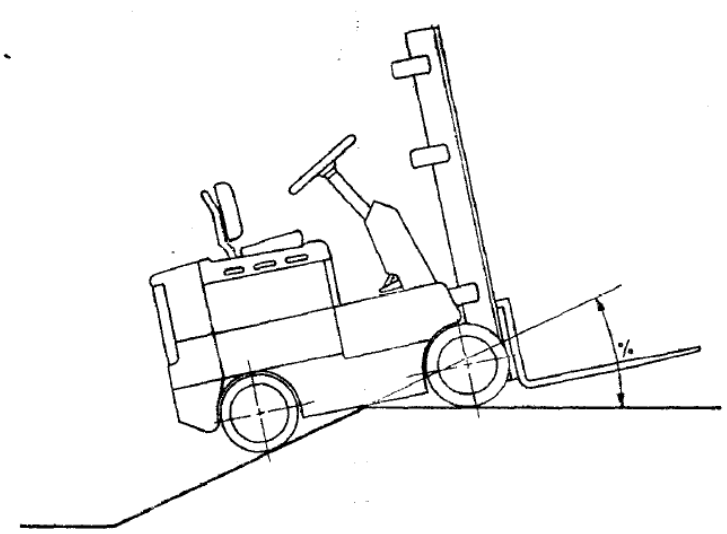


FIG. 22 HUMP CLEARANCE

6.6 Extension or Retraction of the Mast or Fork Arms

a) Forward extension or retraction, and
b) Lateral extension or retraction.

6.7 Travelling

6.8 Inching

Small movements of a truck, to enable a load to be positioned precisely during a handling operation for example in stacking.

6.9 Towing

6.10 Coupling /Uucoupling

a) Coupling, and
b) Uncoupling.

6.11 Rotating (Attachments)

6.12 Pivoting (Mass 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.

6.13 Load Push/**Load Pull**

6.14 Side shifting

6.15 Spreading the Fork Arms (*see* Fig. 21)

6.16 Rotating (Fork Arms)

6.17 Clamping / Unclamping

6.18 Load Stabilization

6.19 Scooping / Emptying

6.20 lowering stabilizers/raising Stabilizers (for one side loading fork trucks)

6.21 Tipping

6.22 Order Picking

7 TERMS RELATING TO SAFETYFEATURES

7.1 Stability

Ability of a truck, either loaded or unloaded, to resist overturning as a result of static or dynamic forces arising in service.

7.1.1 Static Stability

Resistance to overturning of a stationary trucks.

7.1.1.1 Longitudinal static stability

Resistance to overturning of a stationary trucks either forward or backward.

7.1.1.2 Lateral static stability

Resistance to overturning of a stationary trucks to right or left

7.1.2 Dynamic Stability

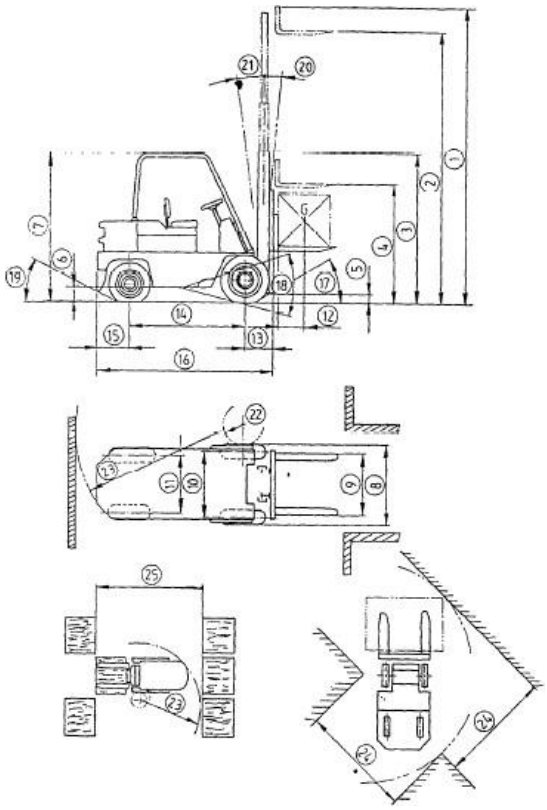
Resistance to overturning of a moving truck under the action of forces developed when travelling and/or handling the load.

7.1.2.1 *Longitudinal dynamic stability*

Resistance to overturning of a moving truck either forwards or backwards.

7.1.2.2 *Lateral dynamic stability*

Resistance to overturning of a moving truck to right or left.



Ref. No.	*Terms*	*Ref. No.*	*Terms*
1.	Height mast extended	14.	Wheel base
2.	Maximum lift heights	15.	Overhang, rear
3.	Height, mast retracted	16.	Length without fork arms
4.	Free lift height	17.	Approach angle
5.	Ground clearance under mast	18.	Ramp angle
6.	Ground clearance at centre of wheel-base	19.	Departure angle
7.	Height of overhead guard or over cab	20.	Forward tilt, *Max*
8.	Overall width	21.	Backward tilt, *Max*
9.	Outride spread of fork arms	22.	Minimum inside turning radius
10.	Track, front	23.	Minimum outside turning radius
11.	Track, rear	24.	Width of theoretical minimum intersecting aisle
12.	Load centre distance	25.	Width of theoretical minimum aisle for right angle stacking (for a given pallet)
13.	Overhan,& front		

FIG. 21 TERMS RELATING TO TRUCK DATA

7.2 Brakes

7.3 Safety Equipment

7.3.1 *Guards for Driving Position*

Complete or partial guard 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.

7.3.2 *Overhead Guard*

Superstructure tied on the truck above the head of the driver, to protect him from objects falling from the load or the stack on which loads are being handled, or from adjacent stacks (*see* Fig. 18).

7.3.3 *Load Restrainer*

Vertical screen usually mounted on the form arm carrier to prevent any part of the load transported or handled from falling towards the operator.

7.3.4 *Spark P-guard* (*Internal Combustion Engine*)

7.3.5 *Exhaust Gas Cooler*

7.3.6 *Exhaust Gas Purifier*

7.3.7 *Flame-proofing Equipment*

7.3.8 *Load Indicator*

7.3.9 *Horn*

7.3.10 *Safety Lock*

Switch to immobilize the truck, operated by a key 01' other means which is removed by the driver when leaving the truck unattended.

7.3.11 *Safety Switch (Seat or Pedal)*

Switch to cut off the power 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 driver-operated truck, or the tiller of pedestrain-controlled truck.

7.3.12 *Safety Reverser*

Device located at the end of the tiller or pedestrain-controlled truck, to reverse the direction of motion when it strikes or approaches the operator (or an obstacle).

7.3.13 *Rear-view Mirror*

7.3.14 *Electrical Overload Switch*

7.3.15 *Anti-collision Device* (*Remote-Controlled Trucks*)

Safety device located ahead of a remote control truck, activated mechanically, optically, magnetically or by other means, which cuts off the supply current to the traction motor whilst applying the brakes.

7.3.16 *Operator Restraining Device*

Means of ensuring the safety of an operator on an order-picking truck; it may consist of safety rails to contain the operator within an enclose area or alternatively it may be harness attached to the truck frame-work by a short length of tope or chain.

7.3.17 *Warning Lights* (*Flashing Beacon, Rotating Flasher etc.*)

ANNEX A

(*Clause* 1.3)

TERMS RELATIXG TO INDUSTRIAL TRAILERS AND OPERATING AREAS OF INDUSTRIAL TRUCKS

A-1 INDUSTRIAL TRAILER

A-1.3 Self-Loading Trailer

A-1.1 Industrial Trailer

Load-bearing wheeled vehicle designed to be towed on the ground by an industrial tractor or truck.

A-1.2 Non-Self-Loading Trailer

Trailer designed only for carrying, and having no loading system.

A-1.3 Self-Loading Trailer

Industrial trailer equipped with a device allowing loading and unloading without the intervention of any lifting or handling equipment.

A-2 OPERATING AREAS OF INDUSTRIAL TRUCKS

A-2.1 Working Area

Area where the truck performs loading, unloading, stacking, unstacking tiering (in racks), untiering and associated operations.

a) Handling at ground level, and
b) Handling above ground level.

A-2.2 Travel Paths

a) Tracks,
b) Aisles, and
c) Ramps.

A-2.2.1 *Dimensions*

a) Minimum free width, and
b) Minimum free height.

A-2.2.2 *Limits of Travel Paths*

A-2.2.2.1 *Marking and signals*

a) Marking
b) Signal - visual or auditive warning of the existence of an obstacle or hazard on the travel path

A-2.2.2.2 *Barrier*

Physical impediment to the passage of trucks or personnel.

a) *Permanent barrier* - Barrier which is structurally secure in position.

   1) *Fixed barrier* - Permanent barrier which does not incorporate a means of passage.
   2) *Opening barrier* - Permanent barrier which incorporates a means of passage

b) *Portable barrier* - Temporary free standing barrier.

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A-2.2.3 *Doors*

a) Manually operated doors
b) Power operated doors

Doors operated by means of electrical, hydraulic or pneumatic power

   i) *Manual control doors* - Power operated doors responding to manual operation of a control.
   ii) *Automatic control doors* - Power operated doors responding to the proximity of a truck.

c) Flexible doors

Doors constructed of a material allowing opening or deformation by a traversing truck.

a) *Hinged doors* - Flexible doors suspended on hinges.
b) *Suspended strip doors* - Flexible doors constructed of strips of flexible material suspended from the upper beam (or lintel).

A-2.2.4 *Bridge Plate and Dockboard*

Rigid movable bearing plate ensuring continuity of a travel path between two operating areas (for example between a platform and vehicle) or allowing passage over an obstacle.