International Standard 6292/1

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Powered industrial trucks — Brake performance — Part 1 : High-lift, low-lift and non-lifting

Chariots de manutention automoteurs — Capacité de freinage — Partie 1 : Chariots élévateurs à grande levée, à petite levée et non élévateurs

First edition — 1981-12-15

UDC 621.868.2 : 629.113-592 **Ref. No. ISO 6292/1-1981 (E)**

Descriptors : industrial trucks, self-propelled machine, braking, tests, braking tests, control devices.

Price based on 3 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6292/1 was developed by Technical Committee ISO/TC 110, *Industrial trucks*, and was circulated to the member bodies in December 1978.

It has been approved by the member bodies of the following countries :

Australia	India	South Africa, Rep. of
Austria	Italy	Sweden
Belgium	Japan	Switzerland
Czechoslovakia	Korea, Rep. of	Turkey
Denmark	Netherlands	United Kingdom
Finland	Poland	USA
France	Romania	USSR

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Bulgaria
Germany, Rep. of
Spain

Printed in Switzerland

Powered industrial trucks — Brake performance — Part 1 : High-lift, low-lift and non-lifting

1 Scope and field of application

This International Standard specifies the performance and test methods for service brakes and the requirements for service brake controls and parking brakes fitted on industrial trucks of the types described below having a maximum capacity of 15 000 kg (30 000 lb).

This International Standard applies to :

— High-lift, low-lift and non-lifting powered industrial trucks under electric or internal combustion engine power and controlled by a seated or standing rider or a pedestrian.

— Stacking-lift trucks with elevatable operating position;

— Lateral stacking-lift trucks.

2 Definition

For the purpose of this International Standard, the following definition applies :

drawbar pull, F : Ratio, expressed as a percentage, of the braking deceleration a to the acceleration of free fall g, or of braking force F_b to weight (force) G.

$$F = \frac{a}{g} \times 100 = \frac{F_b}{G} \times 100$$

3 Service brakes

Friction type brakes, electrical brake systems, and hydrostatic transmissions are among those considered to be service brakes.

3.1 Brake performance

The service brakes shall be capable of developing a drawbar pull (F), on a smooth, level, dry, and clean road surface corresponding to a percentage (%) of the gross vehicle weight (with rated capacity load) with respect to the maximum nominal speed v_1 in kilometres per hour (or v in miles per hour) of the vehicle according to the formula in the table and the corresponding graph, when tested according to the method set forth in 3.2.

NOTE — If the maximum speed v or v_1 respectively is reduced automatically depending on the lift height, this reduced speed may be used to determine F for that lift height. This additional test requirement does not supplant the basic requirement for testing in the load transporting position. (See the table.)

3.1.1 Service brake controls

a) For brakes applied by depressing the brake pedal, the required brake performance in the table shall be attained with a pedal force not greater than 700 N (160 lbf).

b) For brakes applied by an upward movement of the brake pedal (releasing the brake pedal), the required brake performance in the table shall be attained with the pedal fully released. A force not greater than 300 N (65 lbf) shall be required to release the brakes and to hold the pedal fully depressed whilst travelling.

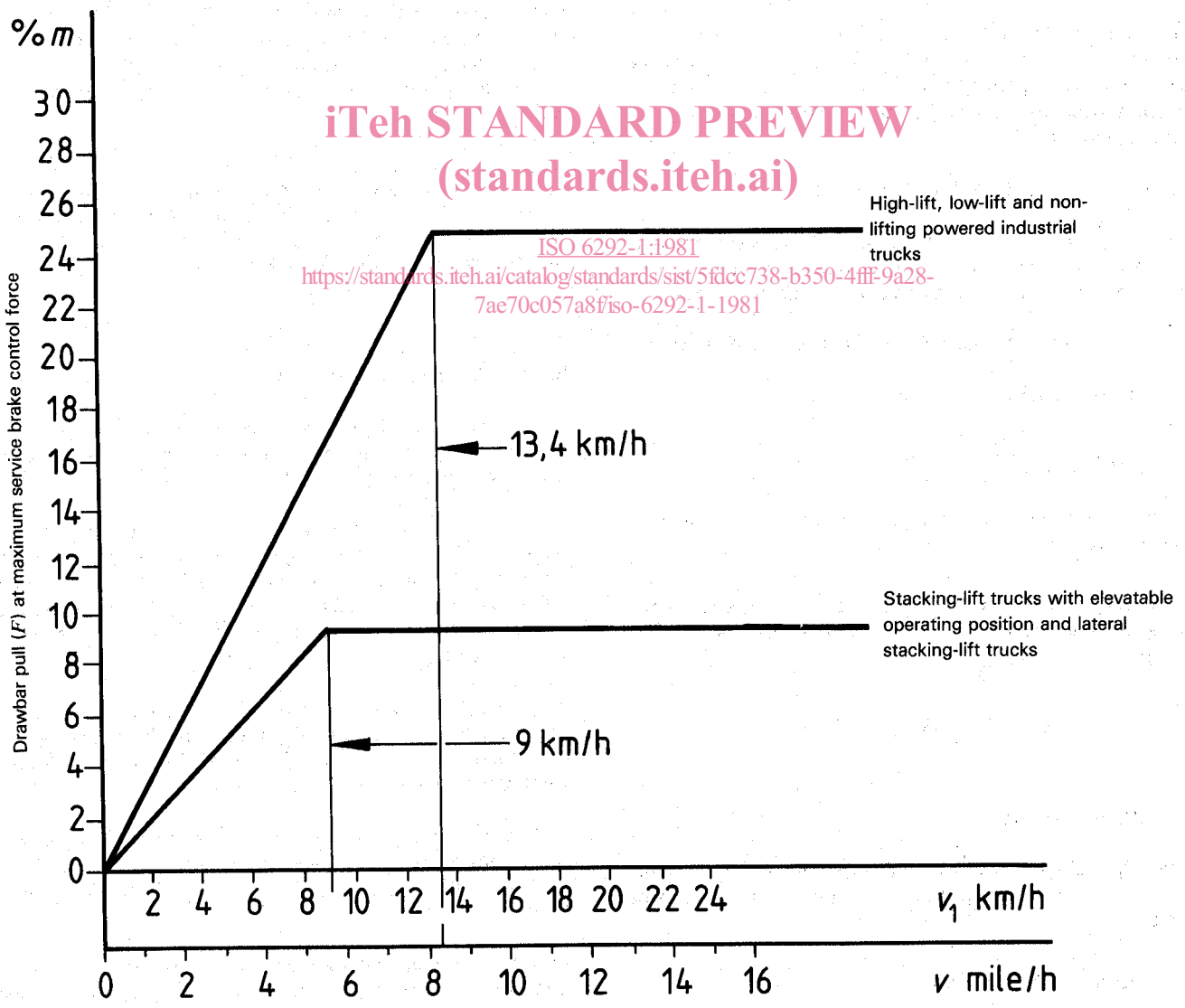
c) For brakes applied by means of a hand lever, the required brake performance in the table shall be attained when a force not greater than 150 N (35 lbf) is applied to the hand lever at the gripping point.

d) For brakes applied by squeezing a hand-grip, the required brake performance in the table shall be attained when a force of not greater than 150 N (35 lbf) is applied at the mid-point of the brake grip.

e) For brakes applied by means of a steering tongue (as on pedestrian controlled trucks), the required brake performance in the table shall be attained at the maximum stroke positions of the steering tongue, or upon release of the tiller or the travel control switch.

Table — Drawbar pull (F) corresponding to a percentage of gross vehicle weight at maximum service brake control force (as given in 3.1.1)

	For v_1 up to 13,4 km/h v up to 8,33 mile/h	For v_1 greater than 13,4 km/h v greater than 8,33 mile/h
High-lift, low-lift, and non-lifting powered industrial trucks excluding stacking-lift trucks with elevatable operating position and lateral stacking-lift trucks	$F \geqslant 1{,}86\ v_1$ * $F \geqslant 3{,}0\ v$ *	$F \geqslant 25\ \%$
	* In the case of reach trucks, these values apply with fully retracted mast or fork.	
	For v_1 up to 9 km/h v up to 5,6 mile/h	For v_1 greater than 9 km/h v greater than 5,6 mile/h
Stacking-lift trucks with elevatable operating position and lateral stacking-lift trucks	$F \geqslant 1{,}0\ v_1$ $F \geqslant 1{,}6\ v$	$F \geqslant 9\ \%$



Figure

3.2 Test methods

3.2.1 Test conditions

When conducting the test, the following conditions apply :

a) The road surface shall be clean and level (± 0,5 % grade) with a dry concrete, asphalt or equivalent surface to permit development of the required drawbar pull.

b) The drawbar shall be horizontal and attached to a point not higher than 900 mm (36 in) above the road surface.

c) The truck shall be laden to its rated capacity;

d) If the truck is fitted with a power boost system (brake servo assistance), the system shall be operating;

e) travel controls shall be in neutral and the parking brake fully disengaged.

3.2.2 Test procedure — Brake controls[1)]

The preferred test procedure is to measure the drawbar pull with a traction dynamometer whilst towing the vehicle at a speed not greater than 1,6 km/h (1,0 mile/h) in both directions with the service brake applied. The requisite brake performance shall be achieved with the application of a control force not greater than that given in 3.1.1.

4 Parking brakes

Industrial trucks shall be equipped with a parking brake capable of holding the truck laden with its rated capacity load, without the assistance of the operator, on the maximum grade which the truck can climb with its rated capacity load, or on the following grade, whichever is lower.

a) Electric or internal combustion powered; seated or standing rider [except types in category b) and d)]	15 %
b) Stacking lift trucks with elevatable operating position and lateral stacking lift trucks	5 %
c) Pedestrian controlled trucks	10 %
d) Narrow aisle trucks	10 %

The parking brake shall hold the truck on the specified grade until released by the operator.

5 Brake operating systems

The service and parking brakes shall be operated by means of independent systems, but may be effective on the same braking equipment (i.e. brake shoes).

NOTE — In the case of powered trucks, with a seated rider, the parking brake shall be capable of being operated manually.

Exception — The above requirement does not apply to trucks equipped with brakes which are automatically applied upon release of the control or failure of the control system. [See 3.1.1 b) and e) for descriptions of these types of trucks.]

1) Other test procedures will be described in a future Technical Report.