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**Vozila za talni transport - Gnana vozila za talni transport - Vidno polje voznika - Preskusna metoda za preverjanje - 9. del: Tovorni in tristrani viličarji z dviznim položajem upravljavca**

Powered industrial trucks - Visibility - Test method for verification - Part 9: Order-picking, lateral- and front-stacking trucks with elevating operator position

Kraftbetriebene Flurförderzeuge - Sichtverhältnisse - Testmethoden zur Verifikation - Teil 9: Kommissionier-Flurförderzeug und Dreiseitenstapler mit anhebbarer Bedienerposition

Chariots de manutention automoteurs - Visibilité - Méthode d'essai et vérification - Partie 9 : Chariots préparateurs de commande, à prise latérale et frontale avec poste de conduite élevable

**Ta slovenski standard je istoveten z: prEN 16842-9**

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English Version

**Powered industrial trucks - Visibility - Test method for  
verification - Part 9: Order-picking, lateral- and front-  
stacking trucks with elevating operator position**

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 150.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## European Foreword

This document (prEN 16842-9:2017) has been prepared by Technical Committee CEN/TC 150 "Industrial Trucks - Safety", the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is intended to be used in combination with the requirements in EN 16842-1. The EN 16842 series consists of the following parts under the general title "Powered industrial trucks – Visibility – Test methods and verification":

- *Part 1: General requirements;*
- *Part 2: Sit-on counterbalance trucks and rough terrain masted trucks up to and including 10 000 kg capacity;*
- *Part 3: Reach trucks up to and including 10 000 kg capacity (under preparation);*
- *Part 4: Variable reach industrial trucks up to and including 10 000 kg capacity (under preparation);*
- *Part 5: Variable reach industrial trucks greater than 10 000 kg capacity (under preparation);*
- *Part 6: Sit-on counterbalance trucks and rough terrain masted trucks greater than 10 000 kg capacity (under preparation);*
- *Part 7: Variable reach and masted container handler (under preparation);*
- *Part 8: Stand on counterbalance trucks up to and including 10 000 kg capacity (under preparation).*
- *Part 9: VNA trucks;*

It is intended to develop the parts related to the following machinery:

- Pallet stacking trucks (rider controlled);
- Burden and personnel carrier;
- Tractor (IND Truck);
- Single side loader;
- Multi-directional forklift truck;
- Articulated counterbalance lift truck;
- Low lift straddle carriers (as defined in ISO 5053-1:2015, Clause 3.18);
- High lift straddle carriers (as defined in ISO 5053-1:2015, Clause 3.19).

## Introduction

This document is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.”

## 1 Scope

This European Standard specifies the requirements and test procedures for 360° visibility of unladen self-propelled industrial order-picking, lateral- and front-stacking trucks with elevating operator position (herein referred to as truck), in accordance with ISO 5053-1 and is intended to be used in conjunction with prEN 16842-1.

Where specific requirements in this part are modified from the general requirements in prEN 16842-1, the requirements of this part are truck specific and to be used for self-propelled industrial order-picking, lateral- and front-stacking trucks with elevating operator position.

This part of EN 16842 deals with all significant hazards, hazardous situations or hazardous events as listed in Annex ZA Table ZA.1, relevant to the visibility of the operator for applicable machines when used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 16842-1:2016, *Powered industrial trucks - Visibility - Test methods and verification - Part 1: General requirements*

EN ISO 3691-1:2015, *Industrial trucks - Safety requirements and verification - Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks (ISO 3691-1:2011, including Cor 1:2013)*

ISO 5053-1:2015, *Industrial trucks — Terminology and classification — Part 1: Types of industrial trucks*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 16842-1, ISO 5053-1 and ISO 3691-3 apply.

## 4 Truck configuration

### 4.1 General

For truck test configuration see prEN 16842-1:2016 Clause 4 shall apply.

### 4.2 Height of load carrying surface

The load carrying surface of the fork arms, measured at the heel end, shall be positioned 100 mm to 500 mm above the floor.

This may be achieved either by raising of the forks (additional lifting device) and/or raising of the operator platform.

NOTE 500 mm is the lift height for travelling as defined in EN ISO 3691-1:2015, definition 3.10

The height of the load carrying surface (lift height of operator platform and additional lifting device) shall be documented in the test report.

### 4.3 Fork arm dimensions

The test truck shall be equipped with fork arms of following nominal lengths:

- Order-picking trucks and lateral- and front-stacking trucks with elevating operator position: 1200 mm.
- Other fork arm lengths may be tested if these adversely affect visibility.

Lengths of forks arms shall be noted in the test report as per prEN 16842-1:2016 8.2. i)

Fork arm lengths in mm are given as two times the length of the standard load centre distance as defined in EN ISO 3691-1:2015, A.2.3.

### 4.4 Additional turret head

If the truck is equipped with an additional turret head, it shall be rotated to its normal operating position; the position shall be documented in the test report. The tests shall be conducted for the worst case, if the worst case is not known, both positions shall be measured.

## 5 Test equipment

Requirements for test equipment are specified in prEN 16842-1:2016, Clause 5.

## 6 Test procedures for direct visibility

### 6.1 Light source position

#### 6.1.1 General

The visibility from the industrial truck shall be determined from all normal operating positions with light sources and a test body or screen. The light sources simulate the range of vision of the operator. The test body simulates an obstacle to be seen

#### 6.1.2 Stand-on operated trucks

The light source fixture shall be positioned relative to the stand index point (STIP).

The STIP is given for a stand-on operator in the normal operating position, with the operator standing at the platform and controlling all functions.

Procedure for locating the STIP:

- a) determine the appropriate foot positions for the truck being evaluated;
- b) determine the position of the ankle pivot point by the shoe outline and the data given in Figure 1;
- c) determine the mid-point of the line connecting the ankle pivot points to establish the STIP;
- d) the 0° position (before any rotation of the operator's head, shoulders, or torso) is a line through the STIP perpendicular to the line connecting the ankle pivot points as shown in Figure 1; the row of lights may be rotated  $\pm 135^\circ$  as shown in Figure 1;
- e) measure the height of the STIP above the floor as well as the location of the STIP relative to a permanent feature of the truck and record.

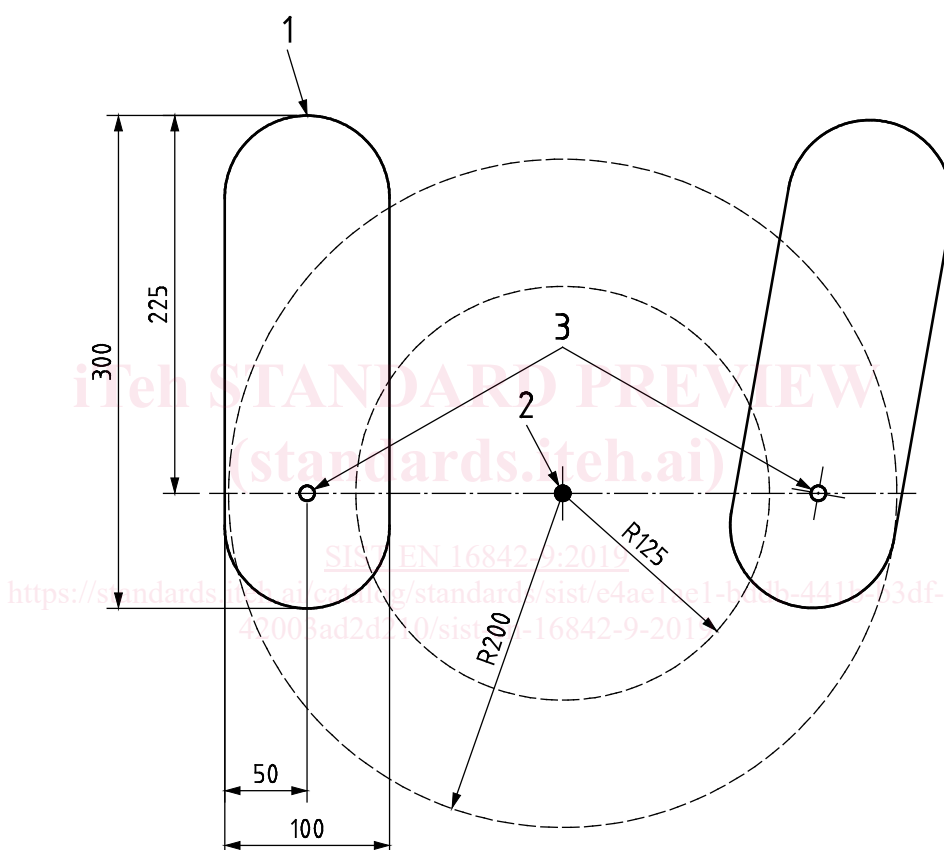
To simulate body movement during truck operation, an adjusted STIP (ASTIP) may be positioned within an area circumscribed by:



- 125 mm radius about the STIP for a stand-up rider truck with defined compartment space where the operator's feet/lower body movements are limited due to truck design;
- a 200 mm radius about the STIP for a stand-up platform truck with space for movement, e.g. order-picking trucks, lateral-stacking trucks.

When the STIP for a truck has been established, the location of the STIP shall remain fixed throughout the visibility evaluation. The ASTIP of the test fixture for a particular test may be relocated as defined above, and shown in Figure 1; the tests may have different locations for the axis of rotation. Each test shall have only one location for the ASTIP which shall be referenced from the STIP and recorded.

Dimensions in millimetres



#### Key

- 1 foot/shoe profile
- 2 STIP
- 3 ankle pivot points

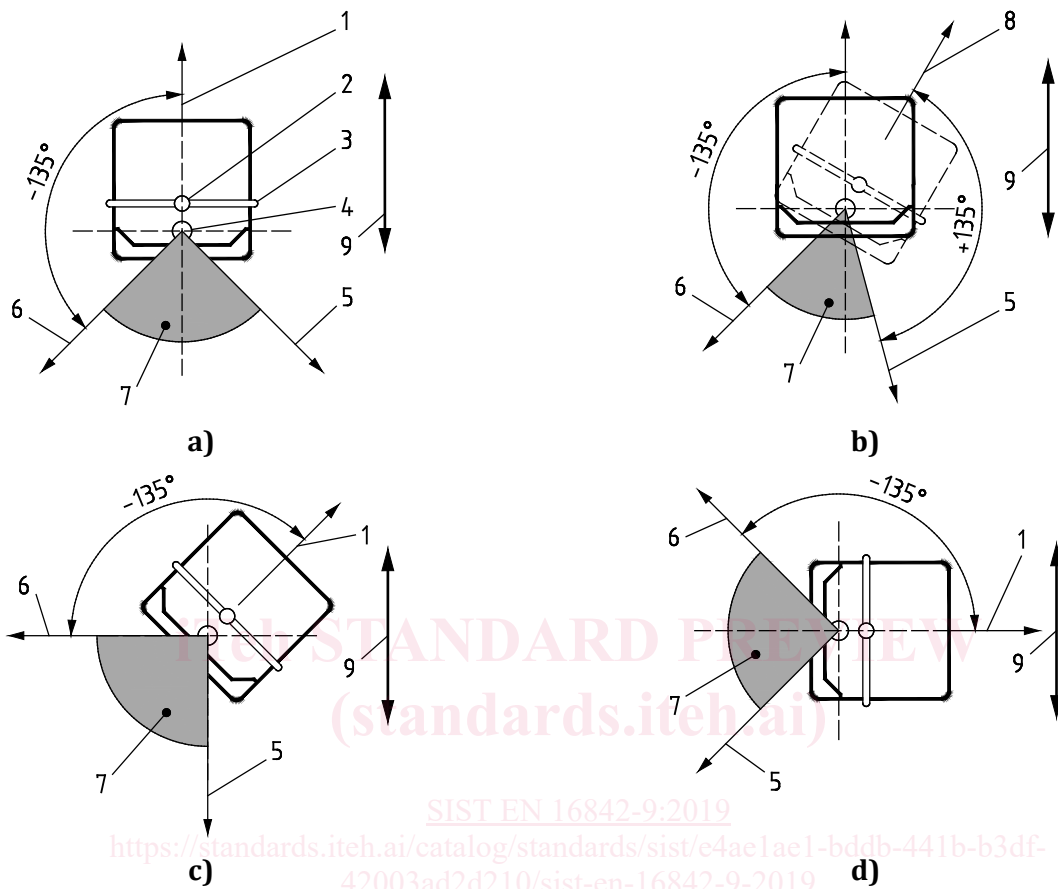
**Figure 1 — Determination of standing index point (STIP)**

#### 6.1.3 Sit-on operated trucks

The light source fixture shall be positioned relative to the seat index point (SIP). The seat shall be placed at the closest adjustment position to the mid-point of horizontal and vertical adjustment and the mid-point of the suspension height, if so equipped. For trucks with rotatable seats, the seat may be turned toward the direction of the test being conducted. See Figure 2.

- a) Sit-on truck where the operator is facing the line of travel.

- b) Sit-on truck where the operator is facing the line of travel equipped with rotatable seat.
- c) Sit-on truck where the operator is facing in 45° angle to the line of travel.
- d) Sit-on truck where the operator is facing in 90° angle to the line of travel.

**Key**

- |                                  |   |
|----------------------------------|---|
| 1 0° seat direction              | 6 -135° test direction  |
| 2 SIP                            | 7 the row of lights cannot be turned to this area for tests         |
| 3 row of lights                  | 8 seat direction rotatable  |
| 4 row of lights axis of rotation | 9 forward and rearward truck direction for all seat positions shown |
| 5 +135° test direction           |   |

**Figure 2 — Seat position and test direction****6.1.4 Test paths for order picking, lateral- and front-stacking trucks with elevating operator position**

Test paths P1 to P9 (see Figure 3 and Figure 4) shall consist of lines laid out on the floor around the test truck, parallel or perpendicular to the truck longitudinal axis. The test paths as shown in Figure 3 and Figure 4 shall be located from the truck profile as defined in prEN 16842-1:2016 Clause 3.1 which includes the front vertical surface of the fork arms (see Figure 3) or the furthest point of the truck (see Figure 4) whichever is applicable.