



SLOVENSKI STANDARD

SIST EN 16186-1:2015

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Železniške naprave - Voznikova kabina - 1. del: Vidljivost, oblika, dostop

Railway applications - Driver's cab - Part 1: Visibility, layout, access

Bahnanwendungen - Führerraum - Teil 1: Sichtbedingungen, Gestaltung, Zugang

Applications ferroviaires - Cabines d'opérateur - Partie 1: Visibilité, layout, accès

Ta slovenski standard je istoveten z: **EN 16186-1:2014**

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45.060.10 Vlečna vozila Tractive stock

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EUROPEAN STANDARD

EN 16186-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2014

ICS 45.060.10

English Version

Railway applications - Driver's cab - Part 1: Anthropometric data and visibility

Applications ferroviaires - Cabines de conduite - Partie 1:
Données anthropométriques et visibilité

Bahnanwendungen - Führerraum - Teil 1:
Anthropometrische Daten und Sichtbedingungen

This European Standard was approved by CEN on 18 October 2014.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 16186-1:2014) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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 2008/57/EC [1].

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

EN 16186, *Railway applications — Driver’s cab* consists of the following parts:

- *Part 1: Anthropometric data and visibility;*
- *Part 2: Integration of displays, controls and indicators;*
- *Part 3: Design of displays.*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 16186-1:2014 (E)

1 Scope

This part of EN 16186 applies to driver's cabs of interoperable rolling stock.

This part of EN 16186 applies to driver's desks installed on the left, on the right, or in a central position in the driver's cab.

For OTMs, see EN 14033-1 [2] and EN 15746-1 [3].

This part of EN 16186 defines:

- anthropometric data;
- visibility conditions from the driver's cab, including forward visibility and the reference positions of line-side signals to be considered;
- assessment methods.

NOTE Due to railway systems constraints the level of visibility provided to the persons outside the defined anthropometric range may vary. Usually the operators manage the potential restriction of front visibility, if the driver uses extreme seat positions combined with extreme body heights.

The occupational aptitude of drivers regarding visibility, whether drivers are in or outside the range of anthropometric data of this standard is outside the scope of this document.

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.

EN 15152, *Railway applications — Front windscreens for train cabs*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

driver

person tasked with operating a vehicle or a train by operating controls in a driver's cab or on a remote control unit

3.1.2

driver's cab

compartment of a vehicle which is equipped with controls and instruments with which the driver controls traction unit(s) in the train

3.1.3**vision area A**

windscreen vision area represented by the trapezoid defined by the intersection of the lines of sight

Note 1 to entry: See Annex A and Annex B.

3.1.4**vision area B**

windscreen vision area outside area A through which the driver may also be required to look

3.1.5**technical specification**

document describing specific parameters and/or product requirements, which have to be agreed by contracting parties

3.1.6**seat reference point****SRP**

reference point at the back pan of a new seat design with a horizontal distance of 135 mm and a vertical distance of 98 mm from the H point according to ISO 20176:2011 [4]

Note 1 to entry: See Figure 2.

Note 2 to entry: For existing seat designs, the SRP may be defined as an alternative via Directive 78/764/EEC [5].

3.2 Abbreviations

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For the purposes of this document, the following abbreviations are used.

DMU	Diesel Multiple Unit	SIST EN 16186-1:2015
EMU	Electric Multiple Unit	https://standards.iteh.ai/catalog/standards/sist/8504c33d-98c5-4a49-9dbc-66ce75afb/sist-en-16186-1-2015
OTM	On-Track Machine	

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4 Driver's anthropometric data

4.1 General

This clause defines the anthropometric data on which the requirements for cab forward visibility are based.

The background on these anthropometric data will be provided in CEN/TR 16823.

4.2 Data

Figure 1 and Figure 2 give the body size measures.

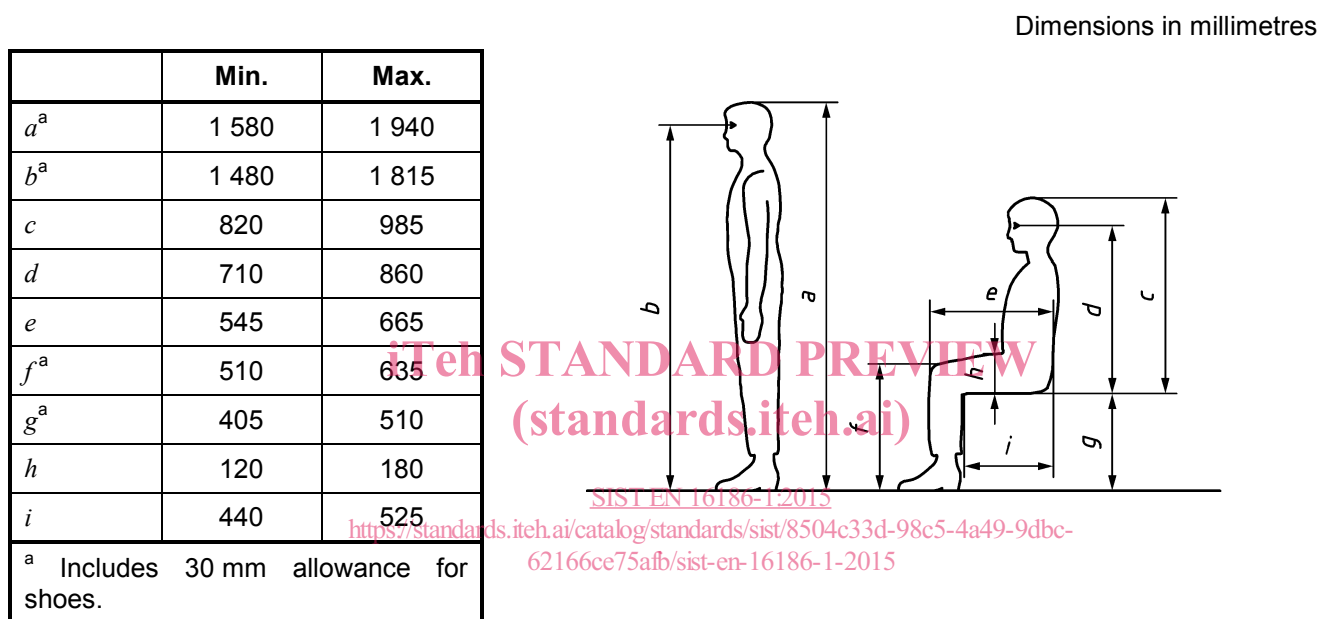
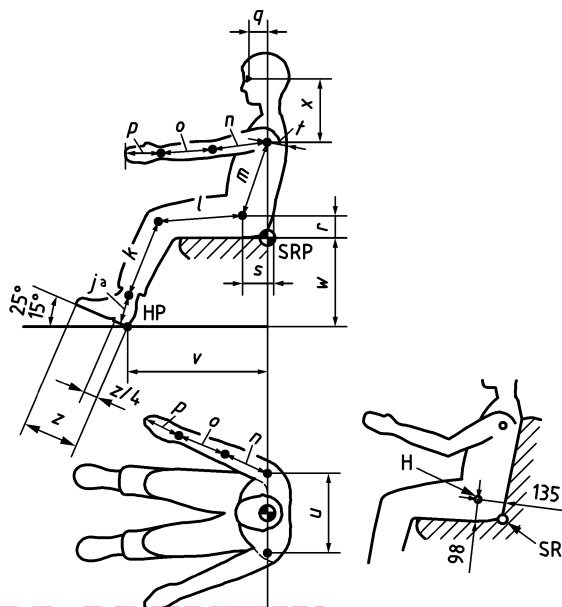


Figure 1 — Principal body size measures

Dimensions in millimetres

	Min.	Max.
j^a	107	126
k	353	457
l	377	473
m	411	498
n	257	312
o	223	266
p	170	221
q	78	90
r	75	101
s	105	121
t	104	131
u	295	387
v	450 to 550	600 to 700
w	390 to 405	470 to 510
x	232	261
z	220	290
^a Includes 30 mm allowance for shoes.		



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Key

- H source for hip point: ISO 20176:2011
 HP heel point (lowest rear point of the heel)
 SRP seat reference point
 $z/4$ non-flexible part of the shoe pad

Figure 2 — Additional body size measures

EN 16186-1:2014 (E)**5 Forward visibility****5.1 General**

For the seated driving position the forward visibility requirements of 5.2.1 shall be ensured (see also Annex A and Annex B).

The horizontal distance from the driver's eye to the windscreen in seated position shall be a minimum of 500 mm and an absolute maximum of 1 715 mm. It is recommended to have a maximum of 1 500 mm.

The sightlines as defined in 5.2.1 shall not be infringed by any permanent equipment of the rolling stock, whether inside or outside the cab.

5.2 Forward visibility requirements**5.2.1 General**

This applies for all units equipped with a cab. For rolling stock which are not covered by the Directive 2008/57/EC, other requirements may apply.

NOTE In this case, for Ireland and UK, the Annex C applies.

The forward visibility for the driver from the normal seated position is covered by the following assessment based on standard reference points and on a vehicle in design mass under normal payload conditions on a straight and level track. The reference points (see Annex A) shall be:

- high reference point: positioned at a height of 6,30 m above the top of rail at a distance of 10 m from the front plane of the buffer or automatic coupler or the most external leading point of the vehicle and positioned laterally right and left from the straight track axis at a distance of 3,50 m, and
- low reference point: positioned at top of rail level at a distance of 15 m from the front plane of the buffer or automatic coupler or the most external leading point of the vehicle and positioned laterally right and left from the straight track axis at a distance of 3,15 m.

The position of the eye points shall be defined by using Figure B.1 for fixed foot rest only or Figure B.2 for fixed seat only or Figure B.3 for seat and foot rest both vertically adjustable.

In case of Figure B.3, the eye points of the small driver are covered by the method defined for the tall driver as defined below:

The demonstration of forward visibility shall be done based on a drawing with theoretical lines of sight:

- to the high reference points, from the mid-point (Point A) between the tall driver's eyes;
- to the low reference points, from a check-point (Point B) vertically below this mid-point at a vertical distance that shall be at least 115 mm and should be 190 mm. As an exception for high-speed trains with a front windscreen inclined less than 35° from the horizontal, the vertical distance for Point B may be reduced to 100 mm.

It is recommended that the minimum longitudinal distance at which low reference points are visible should be reduced.

In the case of using Figure B.1 or Figure B.2, the demonstration of forward visibility shall be performed from a point mid-way between the driver's eyes for both the small and the tall drivers' positions.

The height of the above mid-point between the eyes applied in the demonstration of vertical forward visibility shall apply also for lateral forward visibility.

With this assessment all effects like track curvature, track geometry and vehicle conditions are completely covered, i.e. no additional requirements resulting from those effects shall apply.

5.2.2 Particular cases

For vehicles with centre gangway the lateral forward visibility may be demonstrated only on one side.

For vehicles with central cab the lateral forward visibility for the low reference point may be demonstrated only for the side of the driver's seat, if the movement of the driver in the cab for seeing the low reference point on the other side is not hindered while driving.

5.3 Windscreen requirements

5.3.1 General

Windscreen characteristics are defined by EN 15152.

The projection area of the windscreen (vision area A plus vision area B) on a vertical plane shall have a minimum height of 600 mm and a minimum width of 800 mm. For split windscreen (associated with lateral desk) the width may be reduced to 750 mm.

For centre gangway cabs, the minimum width of the projection area shall be 580 mm.

The minimum height of the upper limit of the transparent windscreen shall be 1 810 mm above cab floor. No permanent equipment shall infringe this limit.

For train sets (defined in TSI) with a windscreen inclined by less than 35° from the horizontal or train sets with maximum design speed greater than 190 km/h, a lower value of the upper limit of the transparent windscreen is permitted.

5.3.2 Windscreen cleaning devices

The location and function of windscreen cleaning and clearance devices shall ensure the external view according to this European Standard in most weather and operating conditions. This is deemed to be fulfilled by provision of cleaning and clearance devices as defined in this standard.

Cleaning and clearance devices shall not permanently inhibit the driver's external view.

The applicable classes as defined in EN 50125-1 [6] shall be defined in the technical specification.

The wiped area shall cover at least 80 % of vision area A. It is recommended to wipe the upper middle zone and the bottom corner zones of vision area A.

If the wiping device is switched off and the cab is activated, the wiper blade shall be outside vision area A (the park position).

The wiper shall provide at least two different wiping speeds.

There shall be a windscreen washing device under control of the driver from inside the cab. Fluid windscreen washing detergents shall be usable by this device.

During windscreen washing and for two to four cycles after the washing jets have stopped, wiping shall automatically be applied.