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Železniške naprave - Voznikova kabina - Temeljne informacije o antropometričnih podatkih

Railway applications - Driver's cab - Background information on anthropometric data

Applications ferroviaires - Cabines d'opérateur - Justification des données anthropometriques

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Bahnanwendungen - Führerraum - Hintergrundinformationen zu anthropometrischen Daten

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European foreword

This document (CEN/TR 16823:2015) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Introduction

This document has been used as a basis for deriving the requirements related to anthropometric data used in the EN 16186 series [5]. The following principles have been applied for the purposes of this document:

— Principle 1: Every identified trend has the same direction in all member states. The direction of a trend could be upwards or downwards. An example for an upward trend would be changes in body height.

— Principle 2: All trends take place at the same time in all member states.

— Principle 3: The impact of every trend is different. Impacts can be treated like a vector.

— Principle 4: Using the average of body height of the European population does not create the height of the 'average European driver'.

1 Scope

This Technical Report describes the background on the anthropometric data provided by EN 16186-1 [1].

2 Terms and definitions

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

2.1
driver
person tasked with operating a vehicle or a train by operating controls in a driver's cab or on a remote control unit

2.2
driver's cab
compartment of a vehicle which is equipped with controls and instruments with which the driver controls traction units in the train

3 Background on anthropometric data

3.1 Sources for current anthropometric data

— European database: PeopleSize Database [2];

— EN ISO 15537 [3];

— recent representative European customer specifications;

— UIC 651 [4].

NOTE It has been proven that anthropometric data provided by UIC 651 are more representative for northern than for southern European populations.

3.2 Preconditions and principles applied

The analysis of the sources mentioned in 3.1 has shown that a number of common parameters exist. The following preconditions apply:

a) if a trend is discovered, it is deemed to apply for all European member states in tendency and timing;

b) trends pointing in different directions are combined and substituted by a resulting common trend;

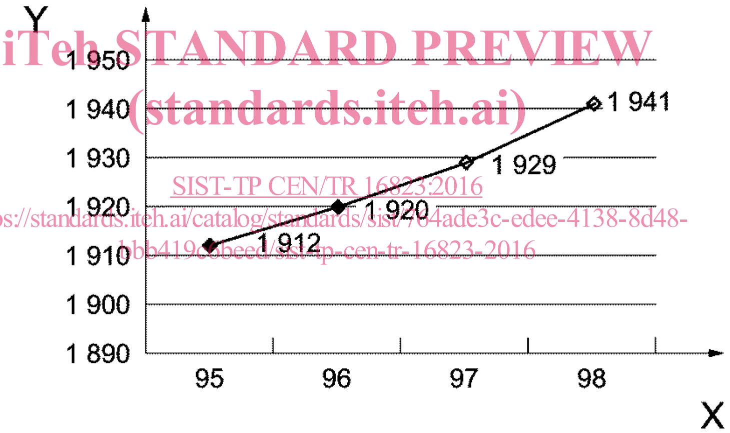
c) the average body height of the weighted European population is not sufficient for determining a future range of driver sizes for Europe;

d) missing data about eastern European drivers are substituted by the average between northern and southern populations;

e) a very common approach for body height (automobile, aviation, clothing industry) takes into consideration:

   1) the 5 % percentile European female, and

   2) the 95 % percentile European male, see Figure 1 and Figure 3.



Key

X population percentile

Y body height, in mm

—◆— indicative, age range 18 to 25 (male)

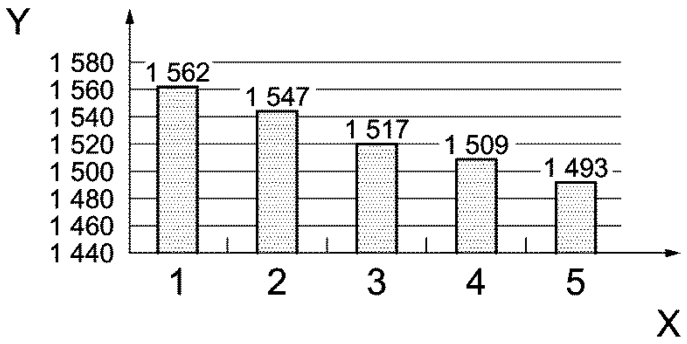
Figure 1 — Impact of the percentile on the body height

3.3 Trend detected and consequences

Body height is shown to be generally higher in northern Europe compared to southern Europe (Figure 2).

NOTE 1 Due to human nutrition and medical research there is an assumed trend of increasing body height by approximately 1 mm p.a. This trend is now assumed to have slowed down or even stopped.

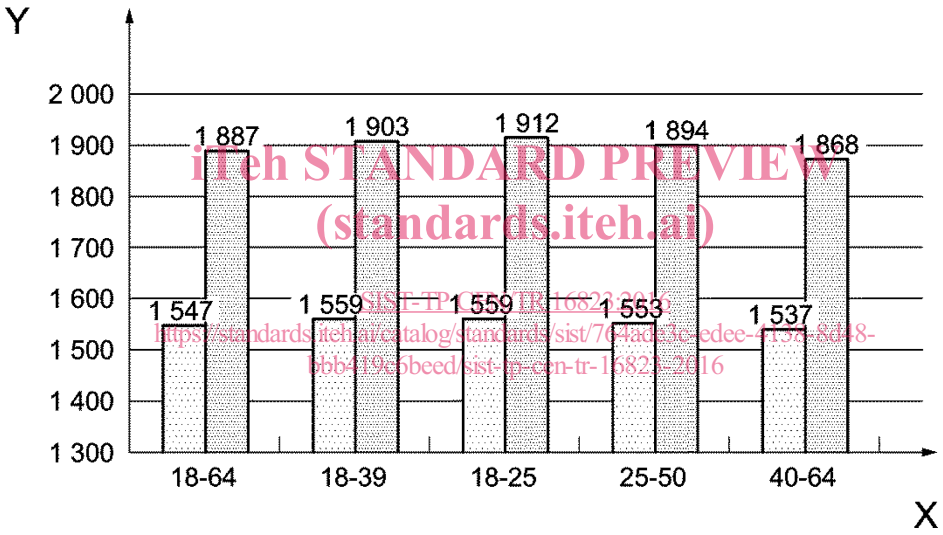
NOTE 2 To account for future changes of body sizes, the average size of people aged 18 years to 39 years is considered to be more representative than that of people aged 18 years to 64 years (Figure 3).



Key

X	member state	1	Sweden	4	Italy (corrective)
Y	body height, in mm	2	Germany	5	Italy (age range 18 to 83)
▨	age range 18 to 64 (5 % female)	3	United Kingdom		

Figure 2 — North–south divide



Key

X	age groups (ranges)	□	typical min. (5 % female)
Y	body height, in mm	▨	typical max. (95 % male)

Figure 3 — Indicative age groups and their body heights

3.4 Impacts which are considered

Impact on height:

— the impact of every trend is different;

— the male and female population are getting taller year by year;

— the higher the percentile value used, the taller the people that will need to be considered.

3.5 Approaching a representative driver height

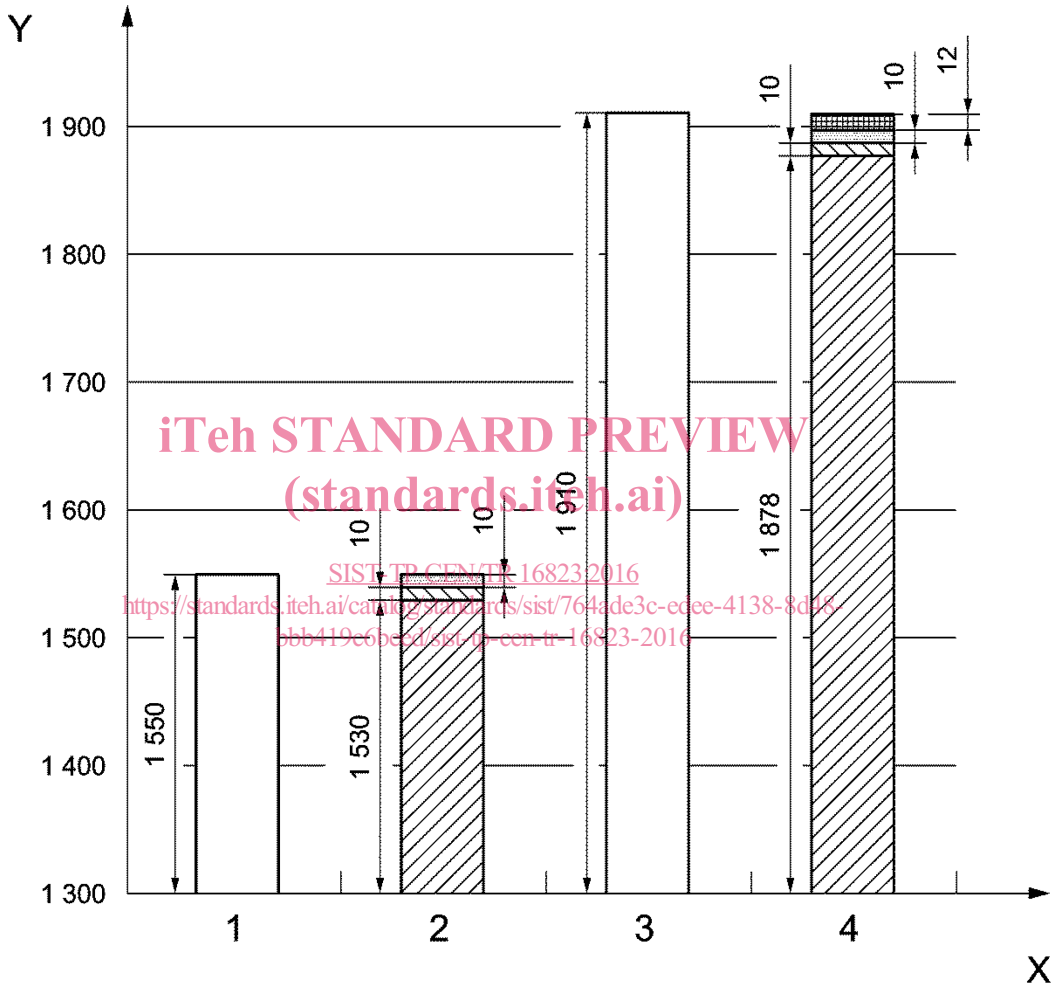
— **Step 1: Validation:**

Deciding on a 'Representative European average' (see Figure 4).

— **Step 2: Fix the future option means:**

Implementation of proposed options (see Figure 4).

— **Result: Consensus 1 550 mm to 1 910 mm:**



Key

X	representative European average	▨	database 'Representative European average'
Y	body height, in mm	1	consensus 5 % European female
▦	increase due to future evolution (for women no increase is considered)	2	typical min. (5 % European female)
▩	data cohort 18 to 60 and 18 to 35	3	consensus 95 % European male
▧	additional for actuality of 10 years old database	4	typical max. (95 % European male)

NOTE Column 1 is explained by Column 2, and Column 3 is explained by Column 4.

Figure 4 — Derivation of the 1 550 mm to 1 910 mm height range