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Railway applications – External visible and audible warning devices for trains – Part 2: Warning horns

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Denna standard ersätter SS-EN 15153-2:2007, utgåva 1.

The European Standard EN 15153-2:2013 has the status of a Swedish Standard. This document contains the official version of EN 15153-2:2013.

This standard supersedes the Swedish Standard SS-EN 15153-2:2007, edition 1.

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EUROPEAN STANDARD

EN 15153-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2013

ICS 45.060.10

Supersedes EN 15153-2:2007

English Version

Railway applications - External visible and audible warning devices for trains - Part 2: Warning horns

Applications ferroviaires - Dispositifs externes
d'avertissement optiques et acoustiques pour les trains -
Partie 2: Avertisseurs sonores

Bahnanwendungen - Optische und akustische
Warneinrichtungen für Schienenfahrzeuge - Teil 2:
Signalhörner

This European Standard was approved by CEN on 10 November 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 15153-2:2013) 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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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 supersedes EN 15153-2:2007.

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.

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

The main changes with respect to the previous edition are:

- technical requirements have been brought in line with the conventional TSIs;
- UIC frequencies (660 Hz; 370 Hz) have been included;
- clarification of the measurement height for the sound pressure level requirement.

This series of documents *Railway applications — External visible and audible warning devices for trains* consists of the following parts:

- *Part 1: Head, marker and tail lamps;*
- *Part 2: Warning horns.*

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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.

SS-EN 15153-2:2013 (E)

Introduction

This European Standard was produced following a review of EN 15153-2:2007 to incorporate the requirements of rolling stock TSIs.

1 Scope

This European standard defines warning horn requirements which deliver the required audibility of approaching trains, including high speed and conventional rail and excluding road, metro and self-contained systems. For this purpose, the following requirements are included:

- functional and technical requirements of the warning horn as a component,
- functional and technical requirements of the integration of warning horns into the vehicle, and
- test requirements.

Operational requirements for warning horns have been excluded.

NOTE The requirements for the control of warning horns can be found in prEN 16186-1.

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 16186-1, *Railway applications — Driver's Cab — Part 1: Visibility, layout, access*

EN 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications (IEC 61672-1)*

EN 61672-2, *Electroacoustics — Sound level meters— Part 2: Pattern evaluation tests (IEC 61672-2)*

EN 60942, *Electroacoustics — Sound calibrators (IEC 60942)*

3 Terms and definitions

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

3.1

warning horn

device or assembly capable of producing the specified audible warning tones

3.2

vehicle front

leading edge of the train in its operational condition

Note 1 to entry: This would be the extreme front edge of any of the following - couplers, buffers, structures and vehicle profile.

3.3

C-weighted sound pressure level

$L_{pCeq,T}$

sound pressure level obtained using the frequency weighting C, given by the following formula:

$$L_{pCeq,T} = 10 \lg \left(\frac{1}{T} \int_0^T \frac{p_C^2(t)}{p_0^2} dt \right)$$

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where

- $L_{pCeq,T}$ is the C-weighted equivalent continuous sound pressure level, in dB;
 $p_C(t)$ is the C-weighted instantaneous sound pressure, in Pa
 T is the measurement time interval, in s;
 p_0 is the reference sound pressure in Pa ; $p_0 = 2 \times 10^{-5}$ Pa

3.4

contractors

organisations responsible for:

- the design, manufacture or supply of the warning horn, and
- the purchase, installation or use of the warning horn

4 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply.

HS RST TSI Technical Specification for Interoperability relating to the rolling stock subsystem of the trans-European high-speed rail system

CR RST TSI Technical Specification for Interoperability relating to the rolling stock subsystem of the trans-European conventional rail system

5 Requirements

5.1 General

Trains shall be fitted with one or more warning horns on the leading vehicle.

All locomotives shall be fitted with warning horn(s) for each direction of travel.

Consideration shall be given to the location of the warning horns, taking into account the possible exposure of staff to excessive noise.

NOTE The aim is to control the risk of accidental hearing damage when a horn is sounded at a time when a person is working close to the horn.

In order to minimise environmental impact, warning horns should be orientated along the longitudinal axis of the vehicle.

It is permissible for trains to be fitted with additional audible warning devices.

5.2 Acoustic requirements

5.2.1 Frequency

The notes of the audible warning horns are intended to be recognisable as being from a train and not be similar to warning devices used in road transport, factories or other common warning devices. The warning horn frequencies shall be selected from the following options:

- a) Two separately sounded warning horns. The fundamental frequencies of the warning horn notes shall be:
high note: 370 Hz \pm 20 Hz

low note: 311 Hz \pm 20 Hz

b) Two separately sounded warning horns. The fundamental frequencies of the warning horn notes shall be:

high note: 660 Hz \pm 30 Hz

low note: 370 Hz \pm 20 Hz

It is permissible for these horns to be sounded simultaneously.

c) Two warning horns sounded simultaneously. The fundamental frequencies of the notes shall be:

high note: 470 Hz \pm 25 Hz

low note: 370 Hz \pm 20 Hz

d) Three warning horns sounded simultaneously. The fundamental frequencies of the notes shall be:

high note: 622 Hz \pm 30 Hz

middle note: 470 Hz \pm 25 Hz

low note: 370 Hz \pm 20 Hz

Where a second sound is required for cases c) and d), this shall be a separately sounded note of 370 Hz \pm 20 Hz.

In the case of trains intended for national use only, the deviation in Annex D is permissible.

5.2.2 Sound pressure level

The C-weighted sound pressure level $L_{pCeq,T}$ produced by each horn sounded separately (or in a group if designed to sound simultaneously) shall be between 101 dB and 109 dB when measured and verified in accordance with the requirements defined in Clause 6.

In the case of trains intended for national use only, the requirements of Annex D may apply.

5.3 Operation

The controls for warning horns shall be in accordance with prEN 16186-1.

5.4 Energy supply

Warning horns shall be operated using an energy source that is readily available on the vehicle carrying the horn. The horn shall meet the technical requirements of this European Standard over the full range of energy levels encountered on the vehicle in its normal operational condition. Where agreed between contractors, the horn shall be operational over an extended range of energy levels.

5.5 Impact protection

Warning horns and their control systems should be protected, so far as it is practicable, from impact and subsequent blockage by airborne objects such as debris, dust, snow, hail and birds. Where such protection features are used, the acoustic requirements shall apply with any protection features in place.