

SVENSK STANDARD

SS-EN 15153-2:2020

**Järnvägar – Utvändiga optiska och akustiska larmanordningar
för fordon –
Del 2: Signalhorn**

**Railway applications – External visible and audible warning
devices –
Part 2: Warning horns for heavy rail**



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Standarden är framtagen av kommittén för Järnvägar, SIS/TK 254.

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Europastandarden EN 15153-2:2020 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 15153-2:2020.

Denna standard ersätter SS-EN 15153-2:2013, utgåva 2.

The European Standard EN 15153-2:2020 has the status of a Swedish Standard. This document contains the official version of EN 15153-2:2020.

This standard supersedes the SS-EN 15153-2:2013, edition 2.

EUROPEAN STANDARD

EN 15153-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

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

Applications ferroviaires - Dispositifs externes
d'avertissement optiques et acoustiques - Partie 2 :
Avertisseurs sonores pour systèmes ferroviaire lourds

Bahnanwendungen - Optische und akustische
Warneinrichtungen - Teil 2: Signaltörner für
Eisenbahnfahrzeuge

This European Standard was approved by CEN on 6 October 2019.

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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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SS-EN 15153-2:2020 (E)

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European foreword

This document (EN 15153-2:2020) 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 2020, and conflicting national standards shall be withdrawn at the latest by July 2020.

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

This document supersedes EN 15153-2:2013.

The main changes with respect to the previous edition are:

- a new frequency option (c) in 5.2.1;
- clarification of the test site requirements (Figure 1) in 6.1;
- addition of Annex A (list of contractual agreements);
- revision of Annex ZA.

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

- Part 1: *Head, marker and tail lamps for heavy rail*;
- Part 2: *Warning horns for heavy rail (this document)*;
- Part 3: *Visible warning devices for urban rail*;
- Part 4: *Audible warning devices for urban rail*.

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 2016/797/EC.

For relationship with EU Directive 2016/797/EC, see informative Annex ZA, which is an integral part of this document.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This document was produced following the creation of EN 15153-4 for urban rail vehicles.

This document was re-named to make a clear distinction between heavy rail and urban rail.

Additionally, Annex ZA was updated for the current status of TSIs.

1 Scope

This document defines warning horn requirements that deliver the required audibility of approaching heavy rail vehicles. The requirements of this document do not apply to urban rail systems.

NOTE 1 The requirements for exterior audible warning devices for urban rail vehicles are found in EN 15153-4.

In the case of shunting heavy rail vehicle formations, the requirements of this document do not apply to the pushed vehicle(s).

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 and maintenance requirements for warning horns are excluded.

NOTE 2 The requirements for the control of warning horns can be found in EN 16186-2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16186-2:2017, *Railway applications — Driver's cab — Part 2: Integration of displays, controls and indicators*

EN 61672-1:2013, *Electroacoustics — Sound level meters — Part 1: Specifications (IEC 61672-1:2013)*

EN 61672-2:2013+A1:2017, *Electroacoustics — Sound level meters— Part 2: Pattern evaluation tests (IEC 61672-2:2013/A1:2017)*

EN IEC 60942:2018, *Electroacoustics — Sound calibrators (IEC 60942:2017)*

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3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

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 is the extreme front edge of any of the following - couplers, buffers, structures and vehicle profile.

3.3

C-weighted sound pressure level (time-equivalent)

$L_{pCeq,T}$

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

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

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

contractor

organization responsible for

- the design, manufacture or supply of the warning horn (may also be referred to as the 'supplier');
and
- the purchase, installation or use of the warning horn (may also be referred to as the 'customer')

4 Symbols and abbreviations

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

Hz Hertz, the SI unit of frequency

5 Requirements

5.1 General

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

All vehicle fronts shall be fitted with warning horn(s).

In the case of shunting locomotives only, the requirements of this document may be satisfied by a single omni-directional warning horn.

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.

The limitation of noise exposure to persons inside the driver's cab are addressed by respecting the limit values for driver's cab noise exposure as given in TSI Noise. In order to minimize 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 Frequencies

The notes of the audible warning horns are intended to be recognizable 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.

NOTE 1 This is derived from TSI LOC and PAS.