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Railway applications – Braking – Automatic variable load sensing devices

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Denna standard ersätter SS-EN 15625:2008, utgåva 1.

The European Standard EN 15625:2008+A1:2010 has the status of a Swedish Standard. This document contains the official version of EN 15625:2008+A1:2010.

This standard supersedes the Swedish Standard SS-EN 15625:2008, edition 1.

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EUROPEAN STANDARD

EN 15625:2008+A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2010

ICS 45.060.01

Supersedes EN 15625:2008

English Version

Railway applications - Braking - Automatic variable load sensing devices

Applications ferroviaires - Freinage - Dispositifs de pesée variable automatiques

Bahnwendungen - Bremse - Automatisch kontinuierlich wirkende Lasterfassungseinrichtungen

This European Standard was approved by CEN on 13 September 2008 and includes Amendment 1 approved by CEN on 30 August 2010.

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
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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 15625:2008+A1:2010) 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of an identical text or by endorsement, at the latest by April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

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 includes Amendment 1, approved by CEN on 2010-08-30.

This document supersedes EN 15625:2008.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

A1 This document has been prepared under a mandate given to CEN/CENELEC/ETSI 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. A1

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1 Scope

This European Standard applies to automatic variable load sensing devices designed to continuously sense the load of a railway vehicle and provide a signal that can be used by a relay valve for the automatic variation of the air pressure used for brake application, thereby adjusting the brake force accordingly to achieve the required brake performance.

This European Standard specifies the requirements for the design, dimensions, manufacture and testing of automatic variable load sensing devices.

2 Normative references

The following referenced documents are indispensable for the application 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 14478:2005, *Railway applications — Braking — Generic vocabulary*

EN 50125-1, *Railway applications — Environmental conditions for equipment — Part 1: Equipment on board rolling stock*

EN 60721-3-5:1997, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 5: Ground vehicle installations (IEC 60721-3-5:1997)*

EN 61373:1999, *Railway applications — Rolling stock equipment — Shock and vibration tests (IEC 61373:1999)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

ISO 8573-1:2001, *Compressed air — Part 1: Contaminants and purity classes*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14478:2005 and the following apply.

3.1.1

automatic variable load sensing device

weighing device

device connected to the vehicle, which responds to the loading of that vehicle to provide a continuous load proportional signal to the brake control device

NOTE The load input is normally a share of the wagon's mass because of the devices position in the vehicle suspension system. The result is a pneumatic output signal pressure that can be any value between a minimum at tare mass and a maximum at maximum mass. Most of the existing self-adjusting load-dependant brakes generate the load signal using a weighing device.

3.1.2

mechanically operated pneumatic device

device or mechanism having both mechanical and pneumatic elements

3.1.3

hydraulic to pneumatic converter

device or mechanism which transforms the hydraulic pressure generated by the mass of the vehicle into a pneumatic pressure with a defined transmission ratio

3.1.4

elastomeric to pneumatic converter

device or mechanism having both elastomeric and pneumatic components, which transforms the pressure in the elastomer generated by the mass of the vehicle into a pneumatic pressure with a defined transmission ratio

3.1.5

output signal pressure

load continuous pressure

Lcp

output pressure delivered by the automatic variable load sensing device, which signals the load of the vehicle to the brake control mechanism

3.1.6

supply pressure

input pressure of the air supply to a pneumatic automatic variable load sensing device

NOTE Typically supplied from the vehicle's distributor auxiliary reservoir, or from the vehicle distributor output pressure/brake cylinder pressure system.

3.1.7

normal litre

NI

unit of mass for gases equal to the mass of 1 l at a pressure of 1,013 2 bar (1 atmosphere) and at a standard temperature, often 0 °C or 20 °C

NOTE Airflow is often stated in normal litres per minute (NI/min).

3.1.8

sensitivity

minimum change of load which causes a variation of the output signal pressure (*Lcp*), when the change of load (input) is in the same direction

3.1.9

hysteresis

difference in output signal pressure (*Lcp*) with the same load, where the load is first rising to a value and then, having been taken past that value, subsequently falls to the same value

3.2 Symbols

F [kN] mechanical force, generated by the share of vehicle weight acting at the automatic variable load sensing device

4 Design and manufacture

4.1 General

The design and manufacture of the automatic variable load sensing device shall, for all intended operating conditions, take into account the following requirements.

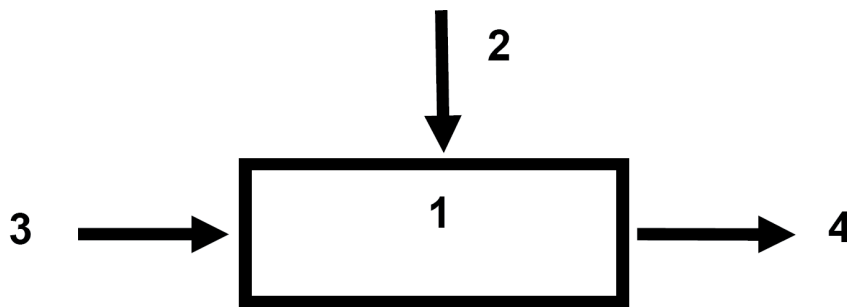
4.2 Functional requirements

4.2.1 Operating requirements

The automatic variable load sensing device shall, in all cases, supply a pneumatic output signal pressure (L_{cp}) which is a function of the load. The transmission of this load signal to the brake control system shall be pneumatic.

The method of producing the pneumatic signal L_{cp} can be a mechanically operated pneumatic device, a hydraulic to pneumatic converter or an elastomeric to pneumatic converter.

Figure 1 indicates the principles of operation of an automatic variable load sensing device.



Key

- 1 automatic variable load sensing device
- 2 F , mechanical force, generated by a share of the vehicle weight
- 3 supply pressure, typically taken from the distributor auxiliary reservoir
- 4 L_{cp} , output signal pressure

Figure 1 — Principles of operation of the automatic variable load sensing device

4.2.2 Characteristics of weighing valves

Two characteristics of weighing valves are defined:

- type 1: $(0,8 \pm 0,1)$ bar/10 kN (see Figure 2);
- type 3: $(1,0 \pm 0,1)$ bar/10 kN (see Figure 3).

The characteristics for type 1 and type 3 shall be tested in accordance with 6.2.6.

NOTE These types are recommended for new interoperable freight wagons. For applications other than interoperable freight wagons other characteristics may be used by agreement between the manufacturer and the customer.