

# SVENSK STANDARD

## SS-EN 15020:2006+A1:2010



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### **Järnvägar – Räddningskoppel – Prestandakrav, geometri för gränssnitt och provningsmetoder**

### **Railway applications – Rescue coupler – Performance requirements, specific interface geometry and test methods**

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Denna standard ersätter SS-EN 15020:2006, utgåva 1.

The European Standard EN 15020:2006+A1:2010 has the status of a Swedish Standard. This document contains the official version of EN 15020:2006+A1:2010.

This standard supersedes the Swedish Standard SS-EN 15020:2006, edition 1.

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EUROPEAN STANDARD

**EN 15020:2006+A1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2010

ICS 45.060.01

Supersedes EN 15020:2006

English Version

## Railway applications - Rescue coupler - Performance requirements, specific interface geometry and test methods

Applications ferroviaires - Attelage de secours - Exigences concernant la performance, la géométrie des interfaces et les méthodes d'essai

Bahnanwendungen - Abschleppkupplung - Leistungsanforderungen, spezifische Schnittstellengeometrie und Prüfverfahren

This European Standard was approved by CEN on 2 October 2006 and includes Amendment 1 approved by CEN on 28 September 2010.

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## Foreword

This document (EN 15020:2006+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of an identical text or by endorsement, at the latest by May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.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 2010-09-28.

This document supersedes EN 15020:2006.

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**

The requirements on coupling interfaces of end couplers will be dealt with in a new work item.

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## 1 Scope

This European Standard specifies the requirements for the rescue coupler for train sets compliant with the Technical Specification for Interoperability High Speed Rolling Stock. It defines the interfaces to which it has to match during rescue operations. It is suitable for locomotives fitted with UIC 520 pattern draw gear and buffers, i.e. moveable draw hook and draw gear capable of compressive loading.<sup>1)</sup>

Provisions going beyond the scope of this European Standard need to be agreed upon by the contracting parties involved.

## 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.

prEN 15085, *Railway applications — Welding of railway vehicles and components*

EN ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections (ISO 5817:2003)*

## 3 Terms and definitions

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

**3.1 rescue coupler**  
special coupling that enables the hauling and propelling of a failed train unit or train set by another vehicle that is equipped with different coupling design

**3.2 rescue vehicle**  
type of vehicle used to rescue a failed train unit or train set

**3.3 automatic coupler**  
latch-type automatic coupler allowing the mechanical, pneumatic and in some cases electrical connection between two train units or train sets without manual assistance, also known as "Scharfenberg system type 10" automatic coupler

**3.4 draw hook**  
part of a conventional and mechanical manual coupling, also known as UIC draw hook

**3.5 main reservoir pipe**  
pipe containing air pressure at a value which is sufficient to supply subsystems including the brake system  
[EN 14478:2005]

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<sup>1)</sup> UIC 520 will be replaced by a European Standard on draw gear and buffers which is in preparation (prEN 15551 for buffers and prEN 15566 for draw gears).



### 3.6

#### **brake pipe**

pipe containing and conveying fluid, usually air, enabling train brake control

[EN 14478:2005]

### 3.7

#### **air pipe coupling head**

special connection situated at the free end of the hoses used for conventional pneumatic links between vehicles (see Annex D)

## 4 Product requirements

### 4.1 Rescue coupler characteristics

The rescue coupler shall be compatible with:

- the Scharfenberg® system type 10 automatic coupler<sup>2)</sup> having the dimensions specified in Annex A and
- the draw hook having the dimensions shown in Figure C.1.

The main dimensions and characteristics of the rescue coupler shall be as given in Annex B.

The mass of the complete rescue coupler in its operational condition shall not exceed 50 kg.

The rescue coupler shall be able to withstand the following loads without permanent deformation:

- maximum tensile load = 300 kN;
- maximum compressive load = 250 kN.

NOTE There are no fatigue requirements for the rescue coupler.

The rescue coupler shall be equipped with handles or components which serve as such for transport and lifting.

Material certificates and weld-classes used shall meet current requirements. Welded parts shall be in accordance with prEN 15085 and EN ISO 5817.

### 4.2 Rescue vehicle characteristics

The rescue vehicle characteristics to be taken into account are defined as follows:

- connections for electric cables and air pipes on head stocks of locomotives (see Figure C.3);
- draw hook (see Figure C.1). Due to different markings located on both sides of the hook it is compulsory to consider a  $59_0^{+2}$  mm hook width;
- pneumatic coupling for brake pipe and main air reservoir pipe (see Annex D). The rescue coupler pneumatic pipes and their connections shall be provided for a 10 bar pressure.

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2) Scharfenberg® is a registered trademark of Voith Turbo Scharfenberg, Salzgitter, Germany. This information is given for the convenience of users of this European Standard and does not constitute an endorsement by CEN of the product bearing this trademark. Equivalent products may be used if they can be shown to lead to the same results.

### 4.3 Fitting procedure

The rescue coupler shall be placed close to the front of the rescue vehicle.

The rescue coupler shall be mounted on the draw hook.

It shall be possible for the coupler to be lifted and mounted onto the draw hook of the rescue vehicle by no more than two persons. The available space around the draw hook of the rescue vehicle shall be taken into account.

Mounting of the rescue coupler on the draw hook shall not require any special tools.

The coupler shall be secured to the draw hook with a fixing device in such a way that it cannot freely move or come off the draw hook during the rescue operation.

Once the rescue coupler is mounted on the draw hook of the rescue vehicle:

- the installed rescue coupler shall have at least  $\pm 6^\circ$  vertical movement from the horizontal during operation;
- it shall be possible for the coupler to be adjusted vertically on the draw hook without the need for special tools;
- coupling and uncoupling operation shall not require any human presence between the rescue vehicle and the failed train unit or train set whilst either is being moved;
- the rescue coupler and the pneumatic hoses shall not limit the maximum lateral movement of the draw hook.

### 4.4 Coupling conditions

#### 4.4.1 Mechanical coupling

The mechanical coupling between the automatic coupler on the failed train set and the rescue coupler on the rescue vehicle shall be automatic.

It shall be possible to couple a train set to a rescue vehicle in a 150 m radius curve. For vehicles fitted with automatic couplers, the car builder shall demonstrate:

- automatic coupling with a rescue coupler
- uncoupling performance in 150 m radius curve conditions.

The rescue coupler shall be designed to ensure that coupling is possible when the height mismatch between the centre lines of the automatic coupler and the draw hook is up to 75 mm. Use of guide horn is not compulsory if this requirement is fulfilled by the vertical adjustability of the rescue coupler.

Coupling operation should be done as follows:

- at a speed not exceeding 2 km/h;
- the rescue coupler shall be aligned in order to be coupled with the mating automatic coupler of the failed train unit or train set to be rescued.

#### 4.4.2 Pneumatic coupling

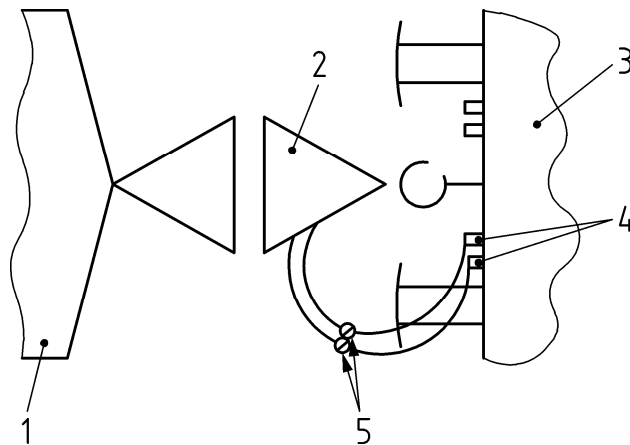
Connection of the air pipes (brake pipe and main reservoir pipe) shall be made semi-automatically through the rescue coupler. Therefore, the rescue coupler air pipe ends shall be equipped with air pipe coupling heads which allow manual connection of the rescue vehicle air pipes (see Figure 1).

Following testing on location at the manufacturer's establishment the air pipes connected to the rescue coupler shall be free to rotate about their axes .

In the case of pneumatic hoses that can be removed from the coupler body, it shall not be possible to refit the hoses incorrectly.

The pipe length (brake pipe and main reservoir pipe) shall be sufficient in order to ensure safe connection between the pipes of the rescue coupler and the rescue vehicle.

After completion of the mechanical coupling operation and the connection of the air pipes, the end-cocks on the rescue vehicle shall be open.



#### Key

- |   |                 |   |                |
|---|-----------------|---|----------------|
| 1 | train set       | 2 | rescue coupler |
| 3 | locomotive      | 4 | air pipes      |
| 5 | ⊕ coupling head |   |                |

**Figure 1 — Pneumatic connection between the rescue vehicle and the rescue coupler**

#### 4.5 Operating conditions

The brake pipe of the rescued train set shall be connected to the brake pipe of the rescue vehicle. The rescue vehicle shall be able to control the braking system of the rescued train set in accordance with the operator's rules.

The rescue coupler when coupled with the automatic coupler of the failed train shall be capable of negotiating a 150 m radius S-curve with an intermediate straight of 7 m without interference to other vehicle elements. The car builder shall demonstrate that the length of the rescue coupler is sufficient.

The minimum speed for hauling and propelling should be 30 km/h because of higher in-train forces resulting from the pneumatic braking system propagation and build-up times. Higher speeds are permissible.