BS EN 16334:2014

BSI Standards Publication

Railway applications — Passenger Alarm System — System requirements

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National foreword

This British Standard is the UK implementation of EN 16334:2014. It supersedes BS EN 15327-1:2008, which is withdrawn.

The UK committee draws users' attention to the distinction between normative and informative elements, as defined in Clause 3 of the CEN/CENELEC Internal Regulations, Part 3.

Normative: Requirements conveying criteria to be fulfilled if compliance with the document is to be claimed and from which no deviation is permitted.

Informative: Information intended to assist the understanding or use of the document. Informative annexes do not contain requirements, except as optional requirements, and are not mandatory. For example, a test method may contain requirements, but there is no need to comply with these requirements to claim compliance with the standard.

When rounded values require unit conversion for use in the UK, users are advised to use equivalent values rounded to the nearest whole number. The use of absolute values for converted units should be avoided in these cases. For the values used in this standard:

3 km/h has an equivalent value of 1 mile/h

200 km/h has an equivalent value of 125 mile/h

The UK participation in its preparation was entrusted by Technical Committee RAE/4, Railway Applications – Rolling stock systems, to Subcommittee RAE/4/-/1, Railway applications – Braking.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2014

ISBN 978 0 580 76365 6

ICS 13.320; 45.060.01

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2014.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16334

August 2014

ICS 13.320; 45.060.20

Supersedes EN 15327-1:2008

English Version

Railway applications - Passenger Alarm System - System requirements

Applications ferroviaires - Système d'alarme passager - Prescriptions relatives au système

Bahnanwendungen - Fahrgastalarmsystem - Systemanforderungen

This European Standard was approved by CEN on 22 May 2014.

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Foreword

This document (EN 16334:2014) 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 February 2015 and conflicting national standards shall be withdrawn at the latest by February 2015.

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 15327-1:2008.

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 Directives 2008/57/EC.

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

1 Scope

This European Standard specifies the characteristics of the Passenger Alarm System. The aim of the Passenger Alarm System is to:

a) permit passengers in case of emergency situations to inform the driver;

b) permit the driver to keep the train moving or to stop the train at a safe location;

c) stop the train automatically:

   1) at a platform,

   2) if there is no acknowledgement by the driver.

This European Standard covers the Passenger Alarm System (PAS) fitted to the passenger carrying rolling stock and specifies:

— the functional requirements for an alarm triggered in the driving cab (Clause 6);

— the communication channel between the driver and passengers or on-board staff (6.4);

— the dynamic analysis of the Passenger Alarm System (Clause 7);

— the requirements for the degraded modes management (Clause 8);

— the safety related requirements (Clause 9);

— requirements for the Passenger Alarm Device and Passenger Alarm Device area (Clause 10).

This European Standard is applicable to rolling stock which are in the field of the Directive 2008/57/EC.

NOTE 1 Existing Passenger Alarm Systems may require modification to work in conjunction with vehicles that comply with this standard.

NOTE 2 Most of the requirements of UIC 541–6 are compliant with this standard.

Other communications systems named 'communication device for passengers' or 'call for aid' in the CR LOC and PAS TSI [1] respectively “Emergency call” or “Call for assistance” in the TSI PRM [3] are not covered by this standard.

NOTE 3 prEN 16683, *Railway applications – Call for aid and communication device – Requirements* covers these aspects.

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.

EN 13272, *Railway applications — Electrical lighting for rolling stock in public transport systems*

EN 14478:2005, *Railway applications — Braking — Generic vocabulary*

prEN 16186 (all parts), *Railway applications — Driver's cab*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

3 Terms and definitions

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

NOTE The definition for 'passenger alarm' given in EN 14478:2005, 4.9.2.2, is superseded by this document.

3.1
Closed Circuit Television
CCTV
on board video recording system

3.2
PAD operated
handle that is operated when it is manipulated in order to change its mechanical status and therefore to send an information to the PAS

3.3
Passenger Alarm Interface
PAI
arrangement of equipment close to each other or one single equipment, which includes:

— passenger alarm device (see Clause 9);

— microphone;

— loudspeaker;

— visual indicators: lights;

— resetting device(s);

— information labels;

— a seal (optional)

3.4
Passenger Alarm Device
PAD
interface to the PAS through which the requirement for a defined Passenger Alarm System demand is indicated or initiated by passengers or operating staff

Note 1 to entry: The PAD is sometimes called emergency handle or alarm handle. These short-terms should only be used where misunderstanding is not possible or in descriptions prepared for passengers. In this document, 'handle' is used as a generic term and its design is defined in 10.2.

3.5
standstill
when the speed of the train has decreased to 3 km/h or less

4 Symbols and abbreviated terms

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

CCTV Closed Circuit Television (see 3.1)

PAI Passenger Alarm Interface (see 3.3)

PAD Passenger Alarm Device (see 3.4)

PAS Passenger Alarm System (see Clause 6)

TCMS Train Control and Monitoring System

5 System overview, architecture and interfaces

An example of the system overview is described in Annex E.

6 Functional requirements

6.1 General

The aim of the Passenger Alarm System is:

a) to permit passengers in case of emergency situation to inform the driver;

b) to permit the driver to keep the train moving or to stop the train at a safe location;

c) to stop the train automatically:

   1) at a platform,

   2) if no acknowledgement by the driver.

The mandatory functions that are set out in this clause are for normal mode operations. They are supplemented by additional optional functions which may be incorporated in the PAS. For degraded modes see Clause 8.

6.2 Advise the driver (and optionally on board staff members or control centre) of a potential danger

6.2.1 PAD shall be available for passengers and staff (see Clause 10 for PAD installation requirements).

6.2.2 The information that at least one PAD has been operated shall be transmitted to the driver.

6.2.3 An acoustic and flashing visual signal shall be given to the driver when a PAD has been operated. For the duration of signals and triggering conditions see Clause 7.

Colour and frequency of visual and acoustic signals in the driver's cab shall conform to the prEN 16186 series requirements.

6.2.4 In addition, if remote resetting of PADs is available, an acoustic signal shall be activated for each new activation of a PAD, in accordance with the safety requirements given in Clause 9.

6.2.5 The maximum permitted delay from any PAD operated and the acoustic and visual signal for the driver is 2 s.

6.2.6 When the driver has acknowledged, each acoustic signal shall be turned off within 1 s, and the visual signal should change from blinking to steady within 1 s. It is permitted to retain a flashing light as a reminder for the driver. A visual signal shall remain until all the PADs operated have been reset.

6.2.7 The system shall indicate to the driver if the PAS is not working properly or is working in limited mode (see Clause 8).

6.2.8 A PAS passenger area module shall not be automatically or remotely isolated.

NOTE This is to ensure a member of the train staff or the driver carries out the isolation.

Colour and frequency of visual and acoustic signals in the driver's cab shall conform to the prEN 16186 series requirements.

6.2.9 Additional optional functions

6.2.9.1 There may be a reminder for the driver that a PAD has been operated by repeating the acoustic and flashing signals at intervals until all the PAD have been reset (cycling through 6.2.3 to 6.2.6). The time interval between reminders may be selected having taken into account the proposed train service.

6.2.9.2 The PAS can advise the on board staff by acoustic and/or visual signals that a PAD has been operated. The recommended maximum delay from any PAD operated and the acoustic and/or visual signal for on board staff is 2 s.

6.2.9.3 The PAS may indicate that a PAD has been operated on the outside of the train.

EXAMPLE An external flashing light on the vehicle where the PAD has been operated.

6.2.9.4 For a vehicle with several compartments, PAS may give information to identify the activated PAD.

EXAMPLE For a vehicle with compartments such as a sleeping car or restaurant car, or the train manager's office, a light outside each compartment could be used to identify the activated PAD.

6.2.9.5 If TCMS from each vehicle to the cab is available, PAS may give an output to identify where a PAD has been operated.

EXAMPLE To show the location on a driver's display in the cab or other areas for on board staff.

6.2.9.6 If train CCTV is available, PAS may inform the CCTV system on the location of the PAD that has been operated.

6.2.9.7 If remote resetting of PAD is available, an acoustic signal may be activated for each new activation of a PAD.

6.2.9.8 The acoustic signal can be turned off if the PAS alarm is supported by an emergency brake application by the driver. In this case, if the automatic brake controller is already in emergency brake position, the acoustic signal sounds for at least 5 s.

6.3 Advise the passenger

6.3.1 When a PAD is operated, the PAI shall give local feedback to the passenger within 1 s maximum.

— The PAD shall be latched in the applied position and shall be visibly different to the un-operated normal status.

— A flashing visual signal (red colour recommended) shall be activated on the PAI.

— An acoustic signal shall be activated.

— If another PAD is operated before the driver's acknowledgement the PAI response is the same.

6.3.2 The PAS shall give feedback of driver's acknowledgement by stopping the PAI acoustic signal and changing status of the previous feedback signal from flashing to steady.

The PAI acoustic signal shall not interfere with the ability of the driver to communicate with the passenger.

6.3.3 After the driver's acknowledgement, if another PAD is operated, the PAI flashing signal goes to steady. PAI acoustic signal is managed for a minimum duration of 3 s, unless communication with the driver is already implemented.

6.3.4 It is recommended that the PAI should indicate when audio communication with the driver is available:

— by a steady green indication;

— by a tone feedback signal.

NOTE A possible tone can be two frequencies (1,5 kHz and 4 kHz), alternating at 8 Hz.

The acoustic signal may be complemented by a broadcast announcement.

EXAMPLE To advise the train crew.

6.4 Manage PAS communication

6.4.1 PAS shall provide an acoustic link to enable a conversation between the driver and the place where the PAD has been operated. That link shall be initiated and closed by the driver.

6.4.2 The acoustic link shall be available at all locations where a PAD has been operated, permitting the driver to talk to every location where a PAD has been operated (link 'one to many' for the driver).

6.4.3 The system shall enable the driver to manage (simultaneously or sequentially) communications from at least one location and up to a maximum of three locations.

6.4.4 A location shall not hear the communication generated by another location, except from the driver, as shown in Figure 1.

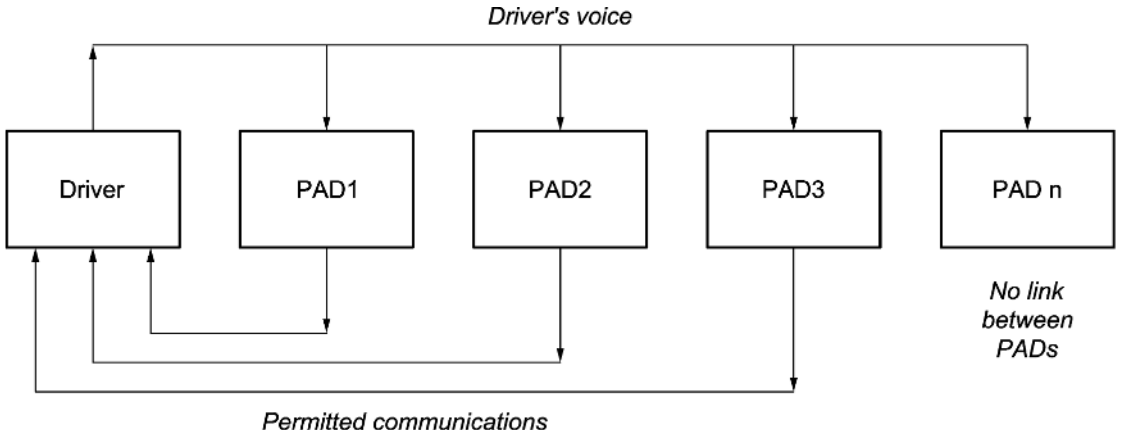


Figure 1 — Permitted communications

6.5 Determine if the train is stopped at a platform or departing from a platform

6.5.1 A train is considered as stopped at a platform if a door 'release' command has been activated and the train is at standstill. A train at a platform where there has not been any door 'release' command is considered as outside a platform area.

6.5.2 PAS shall consider that the train is still at a platform when there has been a change of door status from 'released' to 'closed and locked' and the end of platform has not been passed by the last vehicle.

6.5.3 PAS should have input from an on-board platform detection system.

6.5.4 If the platform is not physically detected, the train shall be considered to have left the platform when either one of the two following requirements is fulfilled:

— the distance covered is (100 ± 30) m; or

— the train travels for a duration of (16 ± 2) s.

6.6 Recognize the action of the driver

6.6.1 The PAS shall recognize if the driver has acknowledged the information that a PAD has been operated.

6.6.2 The PAS shall recognize if the driver has initiated the override of PAS brake request.

6.6.3 The PAS shall recognize if the driver has initiated or closed a communication link with a location where a PAD has been operated.

6.7 Request brake action

The activation of the PAD shall initiate the PAS to automatically request a brake application in the following situations:

a) If the train is at a platform or is leaving a platform (as defined in 6.5), the PAS shall request an emergency brake or full service brake.

b) If a train is outside the platform area described in 6.5, (10 ± 1) s after activation of the (first) passenger alarm, an automatic service brake application shall be requested by the PAS with at least 2/3 of the full service brake effort unless the passenger alarm is acknowledged by the driver within this time. It is permitted to request a full service or an emergency brake application. The PAS shall allow the driver to override at any time a PAS automatic brake request.

   In that case, the driver is permitted to acknowledge after the PAS has requested a brake application. This should cancel the brake request.

   If the PAS alarm is acknowledged by an emergency brake application by the driver, using the emergency brake position of the automatic brake controller, it is permitted that the PAS additionally requests an automatic brake application.

c) If a train, with a PAD operated AND acknowledged by the driver, stops at a platform (6.5) when the doors are released, the PAS shall request an emergency brake application or a full service brake application. As an option the PAS can provide a reminder that the PAD is activated.

d) As an option, for the trains running at high speed, activation of a PAD at a speed greater than a threshold speed of 200 km/h may initiate a controlled reduction in the speed, not less than 160 km/h After acknowledgement by the driver, the response of the PAS is the same as for lower speed.

6.8 PAS actions after PAD activation

6.8.1 If the train is at a platform (doors status 'released') AND a PAD is operated:

a) the PAS requests a brake command (see 6.7);

b) the PAS alerts the driver;

c) if the driver acknowledges it, the audible alert is disabled (sound switched off), but the brake remains applied: no PAS brake override available to the driver until the doors status is 'closed' and 'locked';

d) the PAS will be reset after resetting of all PADs.

NOTE For other processes see Annex A.

6.8.2 If the train leaves a platform area (doors status 'closed' and 'locked') AND a PAD is operated:

a) the PAS requests a brake command (see 6.7);

b) the PAS alerts the driver;

c) if the driver acknowledges, before the train is at standstill, the audible alert is disabled (sound switched off), the brake remains applied: no PAS brake override available to the driver;

d) if the driver acknowledges after standstill the following actions shall occur:

   1) PAS visual alert remains on until PAD is reset,

   2) PAS acoustic alert is turned off,

   3) PAS brake request is overridden.

6.8.3 If the train is not at a platform: see Clause 7.

6.9 PAS power up in the active cab or train reconfiguration

6.9.1 The PAS shall check the status of the PAD on the train. If any PAD have been operated, the PAS shall react as set out in 6.2.

6.9.2 The minimum conditions to determine the availability of the PAS is integrity and continuity of PAS through the train.

6.10 Driver acknowledgement

6.10.1 PAS shall monitor an input to determine if the driver has acknowledged the alarm.

6.10.2 A dedicated interface shall be installed for the driver to acknowledge the alarm. It may be designed as a discrete acknowledgement button (see Figure E.1) or by using the position 'quick release' of the automatic brake controller.

6.10.3 The detection of the movement of the brake controller by the driver, either into full service brake or full release position can be used for acknowledgement. If the brake controller is already in full service, emergency brake or full release position, the dedicated interface should be used to make the acknowledgement.

6.10.4 A PAS acknowledgement shall permit the driver to override the PAS brake request, except at the platform as set out in 6.8.1 a) and when leaving a platform as set out in 6.8.2.

6.11 Overriding PAS brake request

PAS shall not be capable of overriding any brake application initiated by any other system on the train.

6.12 Reset the PAS

6.12.1 The passenger alarm device shall only allow resetting by authorized staff.

6.12.2 The PAS is reset by the following actions.

a) Local reset all PAD operated by special key. If a square key is used, see Annex D. The PAS shall be reset only when all PAD have been reset, as shown in Annex A.

b) A centralized device may be installed to enable the driver to reset all PAD from the active cab (for example if audiocom or CCTV gives relevant information). If such a device is installed, the driver shall be informed about the locations of all the operated PAD.

7 Event sequence

7.1 The PAS should react as shown in Annex A.

7.2 The brake request management by the PAS should follow the diagram shown in Annex B. However, if at any time all operated PAD have been reset, the PAS shall go back to the initial state 'PAS active'.

8 Degraded modes

8.1 PAS degraded mode: isolated or not functioning

8.1.1 Units fitted with a driver's cab shall be fitted with a device which allows authorized staff to isolate the PAS functions in the cab. This mode is called the PAS degraded mode.

8.1.2 The PAD shall remain locally active in the passengers' area and capable of requesting a brake application.

8.1.3 The driver shall be advised that the PAS functions in the cab are isolated or not functioning (see 8.2).

8.1.4 In case of PAS degraded mode it shall be recognised that signalling of passenger alarm activation may not be available in the cab. In that case, no override of the PAS brake request shall be allowed.

8.2 Advising the driver

The PAS shall advise the driver of an incorrect function at least in the following cases:

— in case of malfunction of determining if the train is stopped at a platform or departing from a platform failure;

— in case of malfunction of driver's acknowledgement;

— continuous PAS brake request override;

— inability to advise the driver of activated PAD.

9 Minimum safety requirements

9.1 The failure rate of the PAS to request the brake application shall be less than 10^{-6} failure/h.

9.2 The ability of the PAS to transmit the activation signal of a PAD to the driver shall be monitored by dedicated technical devices if the reliability of the system in conveying the activation signal is insufficient (more than 10^{-6} failure/h).

NOTE The failure rate values given in 9.1 and 9.2 are consistent with UIC 541–6:2010 [2].

9.3 It may be reached by permanent monitoring of that ability, and it shall be demonstrated through a safety analysis.

9.4 The failure rate for the system (including acoustic signalling, visual signalling, PAS brake application request, those three systems being considered as complementary systems) to signal the driver that a PAD has been activated shall be less than 10^{-6} failure/h.

9.6 A PAS passenger area module shall not be automatically or remotely isolated. It is mandatory that a member of the train staff or the driver carries out the isolation.

10 Requirements for PAD

10.1 Installation requirements

10.1.1 With the exception of toilets and gangways, at least one clearly visible and indicated PAD shall be provided in each compartment, each entrance vestibule and all other separated areas intended for passengers and on-board staff.

10.1.2 As a minimum, PADs shall be located so that to access a PAD, it is not necessary:

— to pass through an internal door;

— to climb or descend a stair (for example double deck vehicle);

— to walk more than 12 m.

10.1.3 Locating a PAD on a passage with stairs is forbidden.

10.1.4 The interior design should avoid any situation where PAD can be covered or masked or access can be prevented.

EXAMPLE Rolling stock equipment, luggage, clothes, tip-up seats.

10.1.5 The PAD shall be identifiable from at least 6 m distance.

10.1.6 Where a PAD cannot be easily seen from within a passenger area, an additional sign shall be provided informing persons in that area of the location of the nearest PAD. An example is given in Annex H.

10.1.7 The PAD location shall not exceed 2,05 m and shall not be less than 1,5 m in vertical direction from the floor.

10.1.8 The PAD shall be placed in a position where it cannot be operated unintentionally (e.g. near luggage racks).

10.1.9 The PAD may be protected with covers, preventing unintentional operation. The PAD shall be visible through the cover. Access to the PAD shall not be restricted by the presence of the cover.

10.1.10 PAD shall be clearly distinguishable with regard to shape and clearly separated from other devices such as emergency door release and call for aid.

10.1.11 PAD labels shall be clearly distinguishable with regard to colour.

10.1.12 PAD feedback lights and interface with the audiocom system shall be located so that the passenger does not have to move after operating the PAD.

10.1.13 To help the staff to identify the operated PAD, the feedback lights shall be clearly visible from at least 2 m.

10.2 Passenger interface

10.2.1 PAD

10.2.1.1 PAD requirements

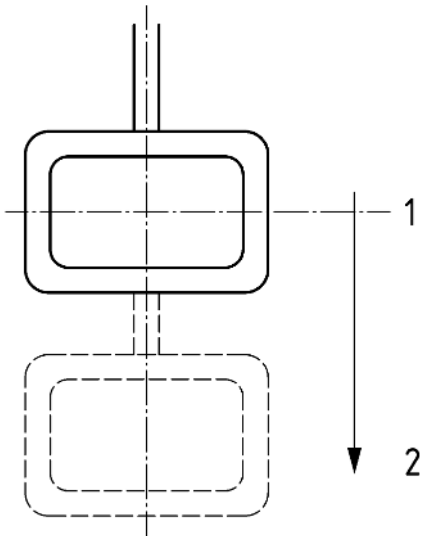
The PAD shall be operated by pulling (see Figure 2). It is permitted to use a push button, especially in the case of PAD used in PRM location (which is not mandatory). The design of that push button shall prevent unintentional use.

NOTE Using a handle is the recommended solution for minimizing the risk of unintentional use.

When it is operated, the PAD shall go from position 1 to position 2 (i.e. change of position between status 'active' and 'inactive'). The PAD is operated to activate the PAS, which action is latched. It is not necessary to keep the PAD in position 2, however it shall not go back to position 1 before being reset. The reason is that it shall be immediately visible that a PAD had been operated.

10.2.1.2 If the PAD is partially operated (leaving position 1, but not going to position 2), it is permitted to go back to position 1, without changing the PAS status.

The design is presented in Figure 2.



Key

1 closed position: stand-by

2 alarm position: PAD operated

Figure 2 — Passenger PAD movement example

10.2.1.3 For the PAD shown in Figure 2, the overall dimension of the PAD hand contact area shall follow the dimension shown in Annex F.

10.2.1.4 The materials used in the construction shall be appropriate to ensure sufficient integrity to avoid rupture when the PAD is normally operated.

10.2.1.5 The red colour shall be chosen amongst the colours defined in ISO 3864-4:2011, Table 1.

10.2.1.6 The PAD shall be clearly distinguishable from its background environment.

10.2.1.7 The vertical force needed to pull the passenger alarm PAD shall be between 65 N and 120 N without a seal present. If the operation of the PAD requires the breaking of a seal, it shall not require more than 60 N to break the seal.

10.2.1.8 For devices not operating with a vertical movement, the force needed shall be equivalent to the requirement in 10.2.1.7.

10.2.1.9 The interfaces for resetting the PAD are defined in Annex C and Annex D.

10.2.2 Information labels

10.2.2.1 Instructions shall be given to passengers on the activation of passenger alarms.

10.2.2.2 The PAD shall be clearly indicated by easily understandable logos and instructions enabling passengers to use it without difficulty:

— Visual information related to the PAS shall be legible for minimum lighting conditions given by EN 13272 when the light of the vehicle is operational.

— All safety, warning, mandatory action and prohibition signs adjacent to the PAD shall include pictograms and should follow the principles set out in ISO 3864-1.

— Information not directly relevant for PAS usage shall not be combined with the PAS information.

— Visual information shall contrast with its background.

— Labelling should be placed at a maximum distance of 15 cm from the device.

10.2.2.3 The PAD installed on the passenger vehicle shall be identified by a clear inscription (see Annex G and Annex H). Minimum dimensions for lettering are 7 mm for headlines and 4 mm for additional text.

Minimum dimensions for overall label are: surface more than 100 cm^2, and no dimension less than 60 mm.

10.2.2.4 The label shall be written in the national language(s), complemented at least with English and shall be located adjacent to each PAD, identifying it. The mandatory minimum text in English is: ALARM.

10.2.2.5 The inscriptions shall be white text on a red background (see 10.2.1.5 for colour red).

The white colour shall be chosen amongst the colours defined in ISO 3864-4.

10.2.2.6 It is mandatory to explain to the passenger the following steps in at least one national language and in English:

— Red flashing light: please wait;

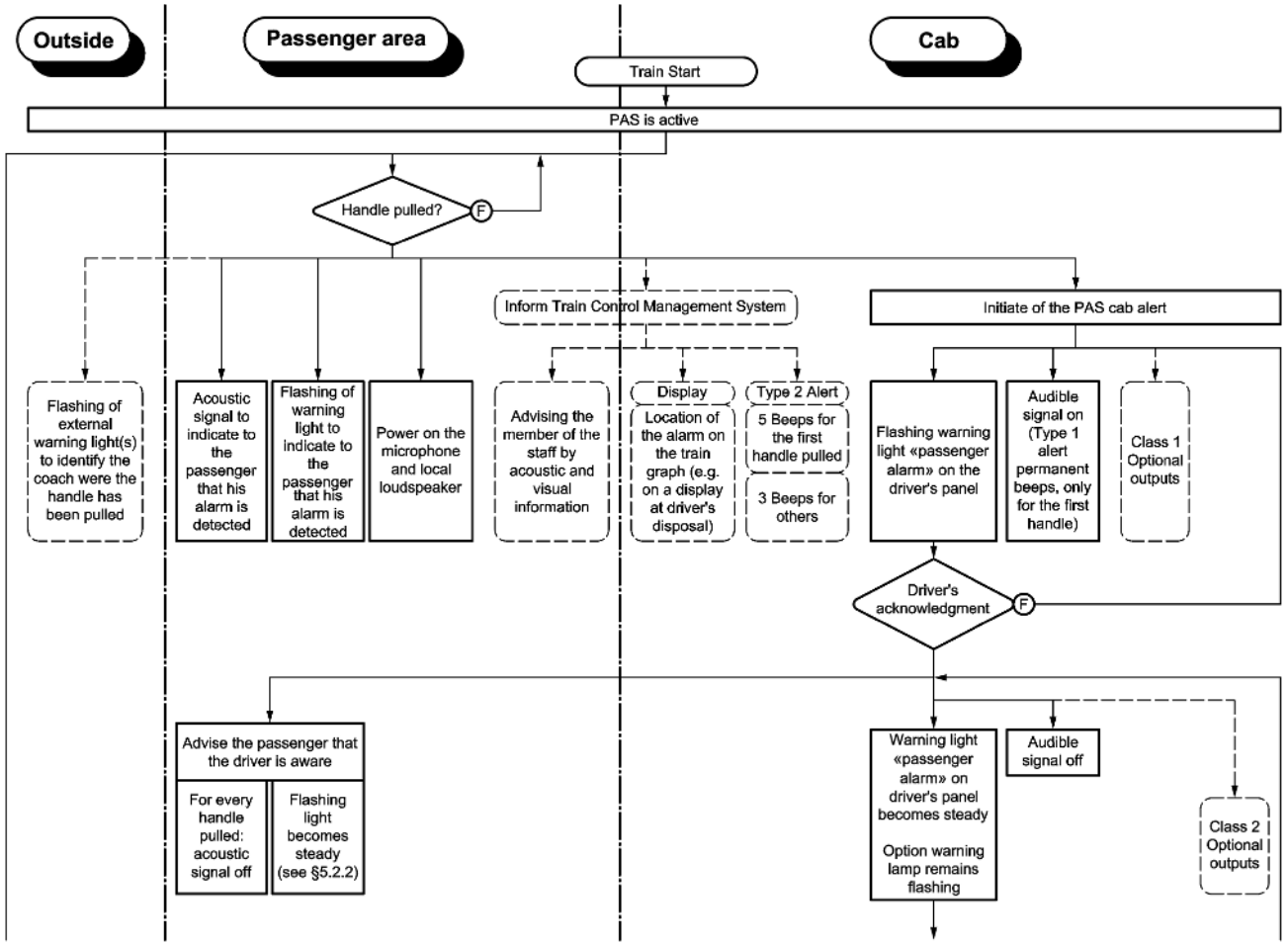
— Red steady light: staff aware;

— Green light: speak with the staff (if fitted, see Annex A).

The design of the label used is free.

Annex A
(normative)

PAS information management



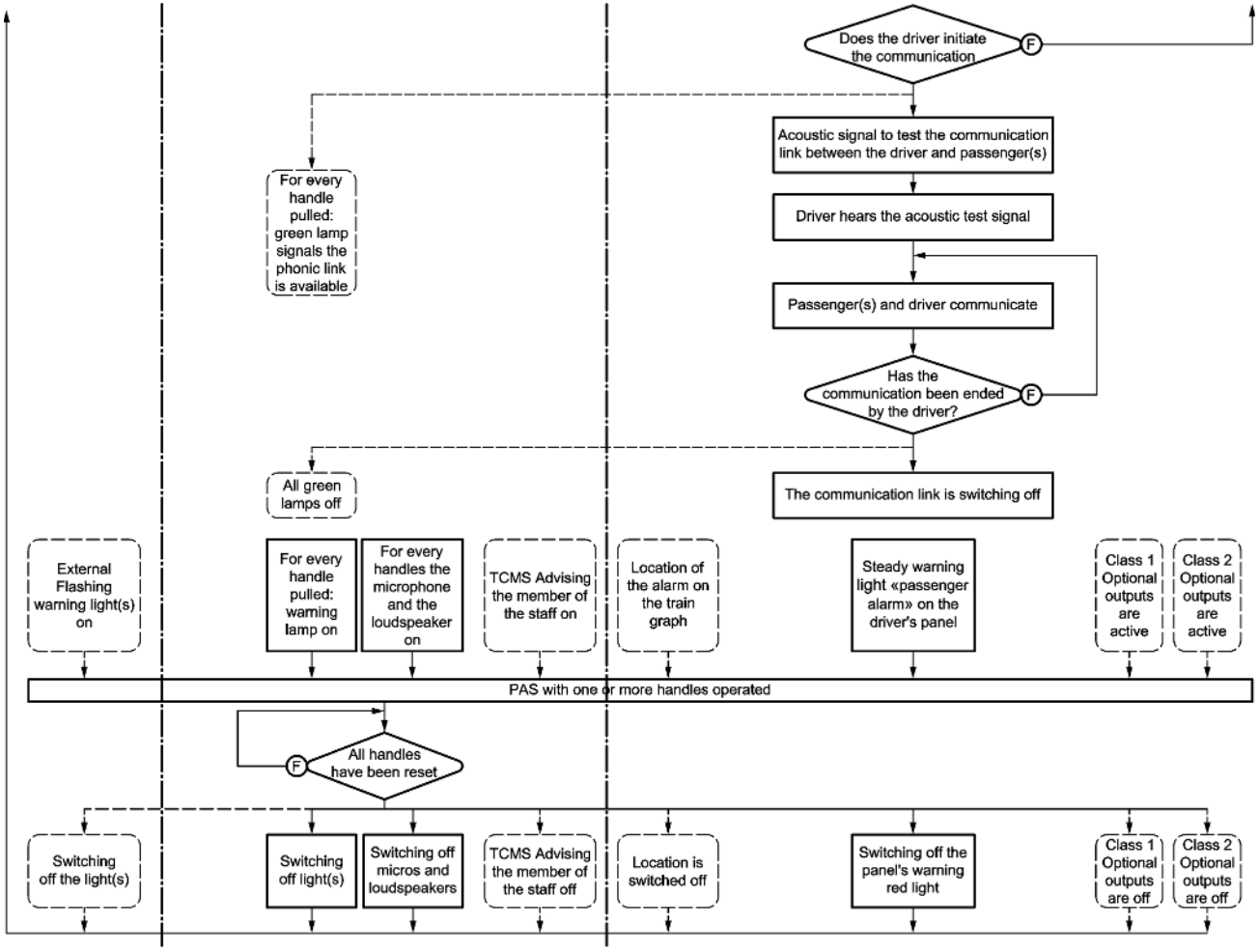


Figure A.1 — PAS information management

Annex B
(normative)

PAS brake request management

Rule: If at any time all PAD operated have been reset, the PAS shall go back to the state 'PAS active'.

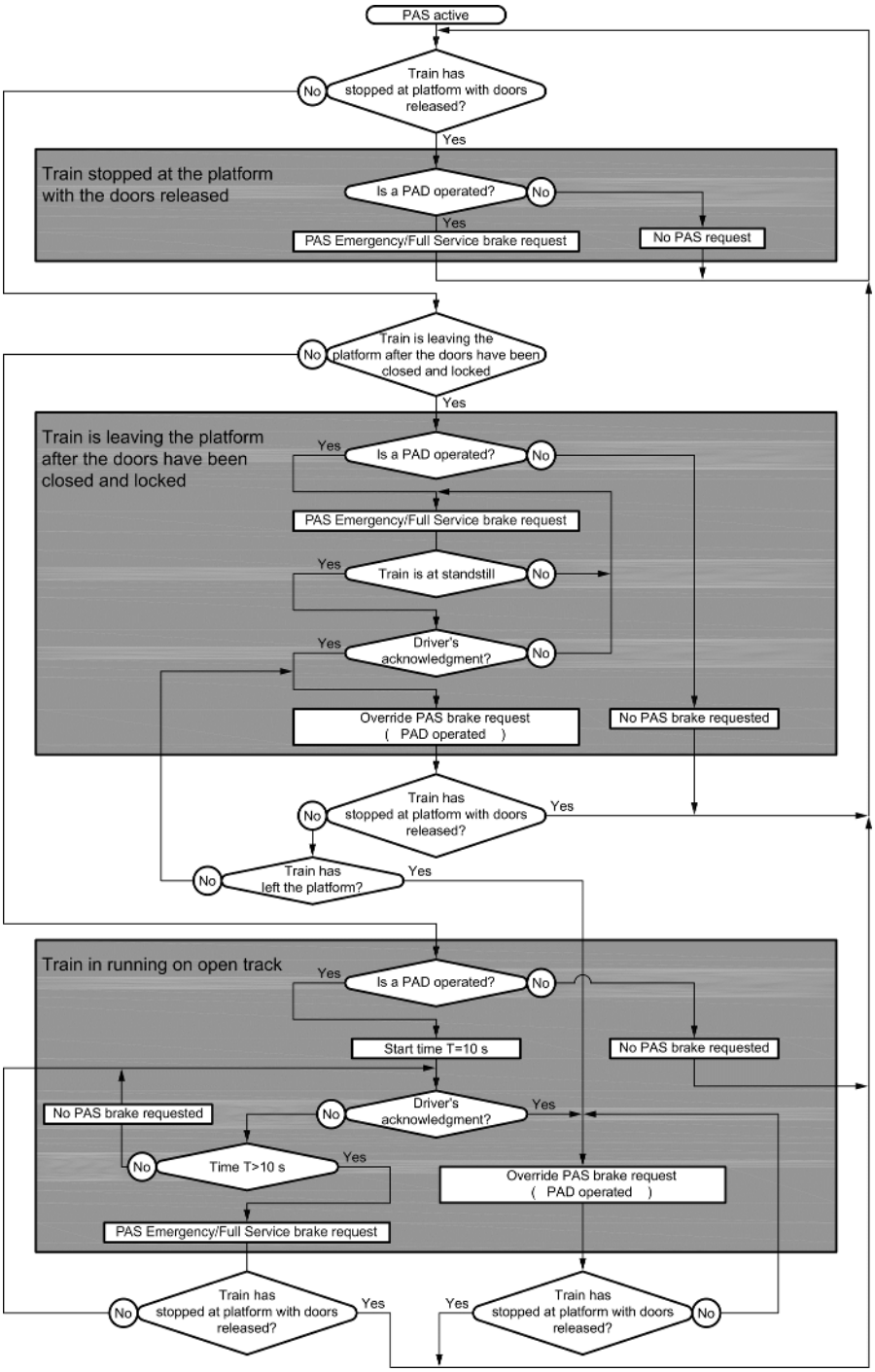
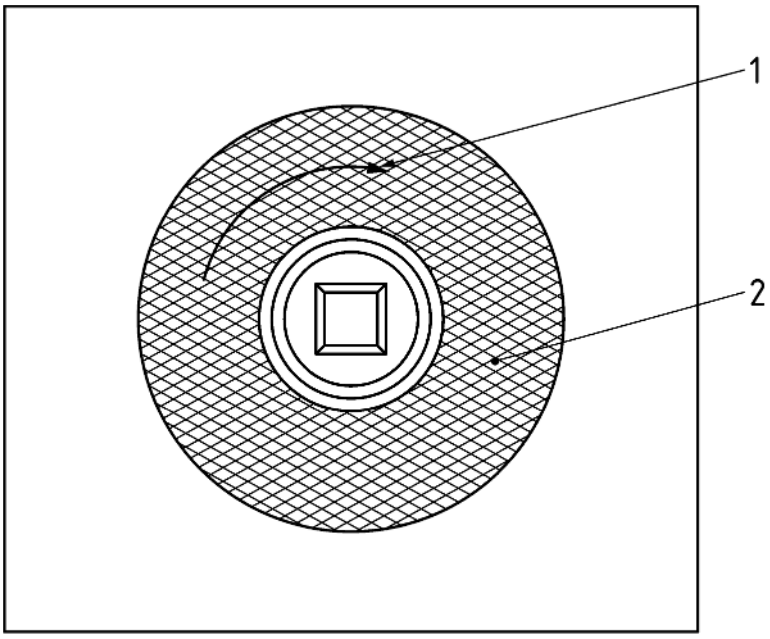


Figure B.1 — PAS brake request management

Annex C
(normative)

Sign indicating the reset equipment for the local PAD

Figure C.1 shows the return manoeuvre that is done directly with the square key (no cover).



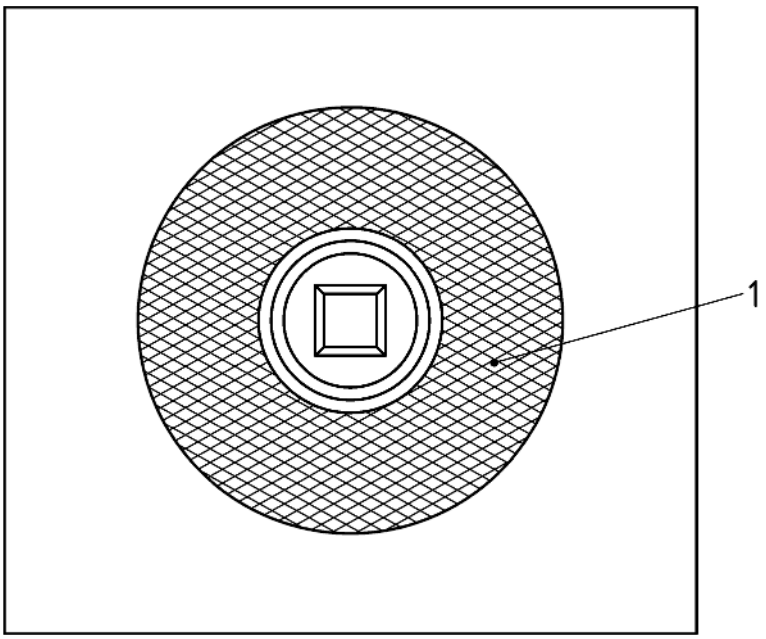
Key

1 black

2 red

Figure C.1 — Return manoeuvre done with square key

Figure C.2 shows the sign on the cover, if fitted, that has to be opened to perform the return manoeuvre.



Key

1 red

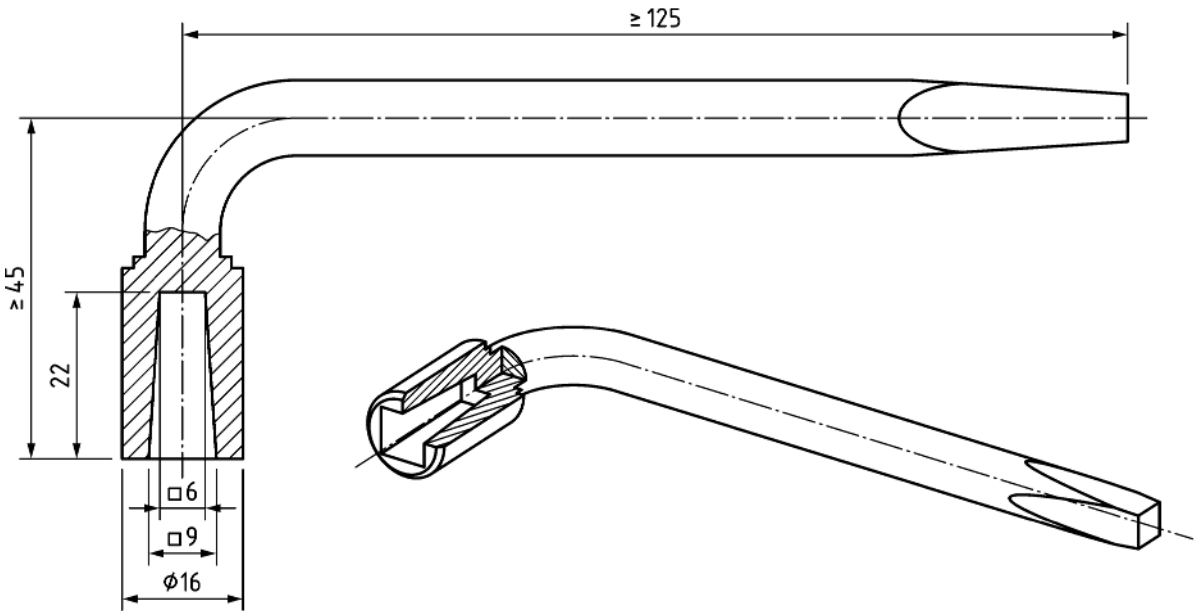
Figure C.2 — Return manoeuvre requiring the opening of the cover

Annex D
(informative)

Square key to restore the passenger emergency brake PAD in the initial position (mandatory for international service trains)

Figure D.1 shows the square key to restore the passenger emergency brake PAD to the initial position.

Dimensions in millimetres



NOTE Dimensions without tolerances are in accordance with ISO 2768 medium H.

Figure D.1 — Square key to restore the passenger emergency brake PAD in the initial position

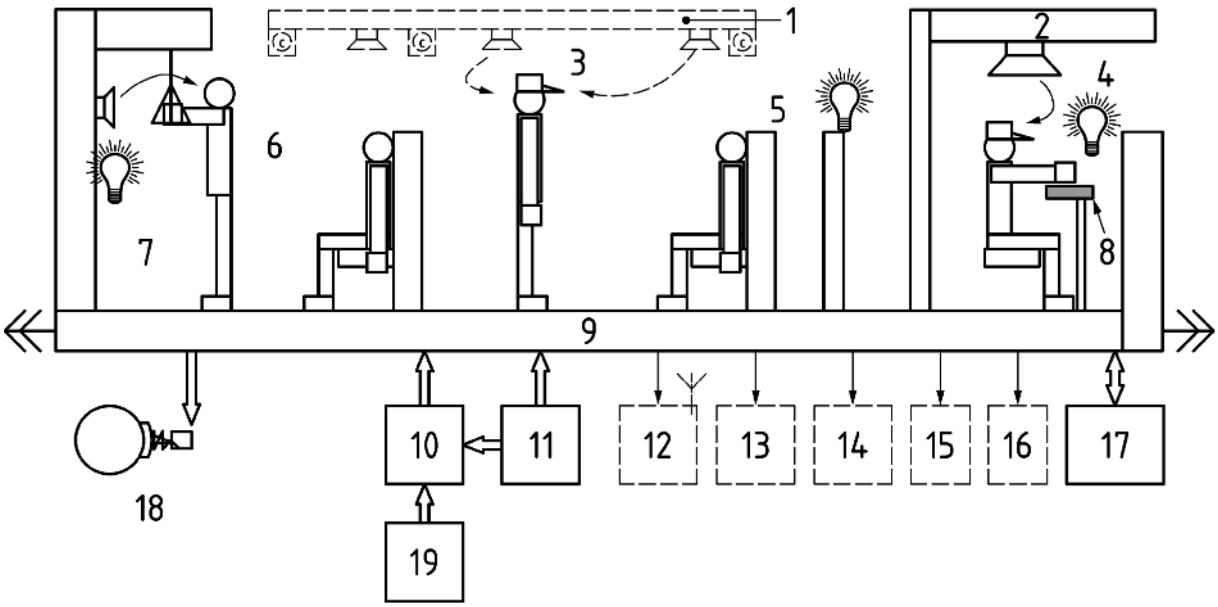
Annex E
(informative)

System overview

E.1 General

The PAS overview is summarized by Figure E.1. Figure E.1 shows the Passenger Alarm System with its functions and the interaction with passengers and/or train staff.

The different elements are more precisely described in Clause 6.



Key

1	Advise the staff that a handle has been pulled by a signal				
2	Driver's cab	8	Acknowledgement and/or override braking button	14	Information system
3	Member of staff	9	Passenger Alarm System (PAS)	15	Video system
4	Visual and acoustic devices	10	Identification of station area	16	TCMS
5	Visual indication to the staff	11	Speed signal	17	Audio/Intercom communication
6	Passenger pulling handle	12	Wireless link	18	Brake system (external to PAS)
7	Visual and acoustic feedback	13	Recorder	19	Doors command interface
	Mandatory system		Optional system		Camera (optional)

Figure E.1 – PAS overview

E.2 System architecture

The PAS shall be described in an architecture equivalent to the subsystems shown in Figure E.2:

a) PAS Cab module;

b) PAS passenger module;

c) PAS Audio/intercom; and

d) TCMS (option).

For safety requirements, see Clause 9.

The 'Alarm loop' shown on the Figure E.2 is not a mandatory solution.

The link between PAS modules and TCMS are options (see Figure E.2).

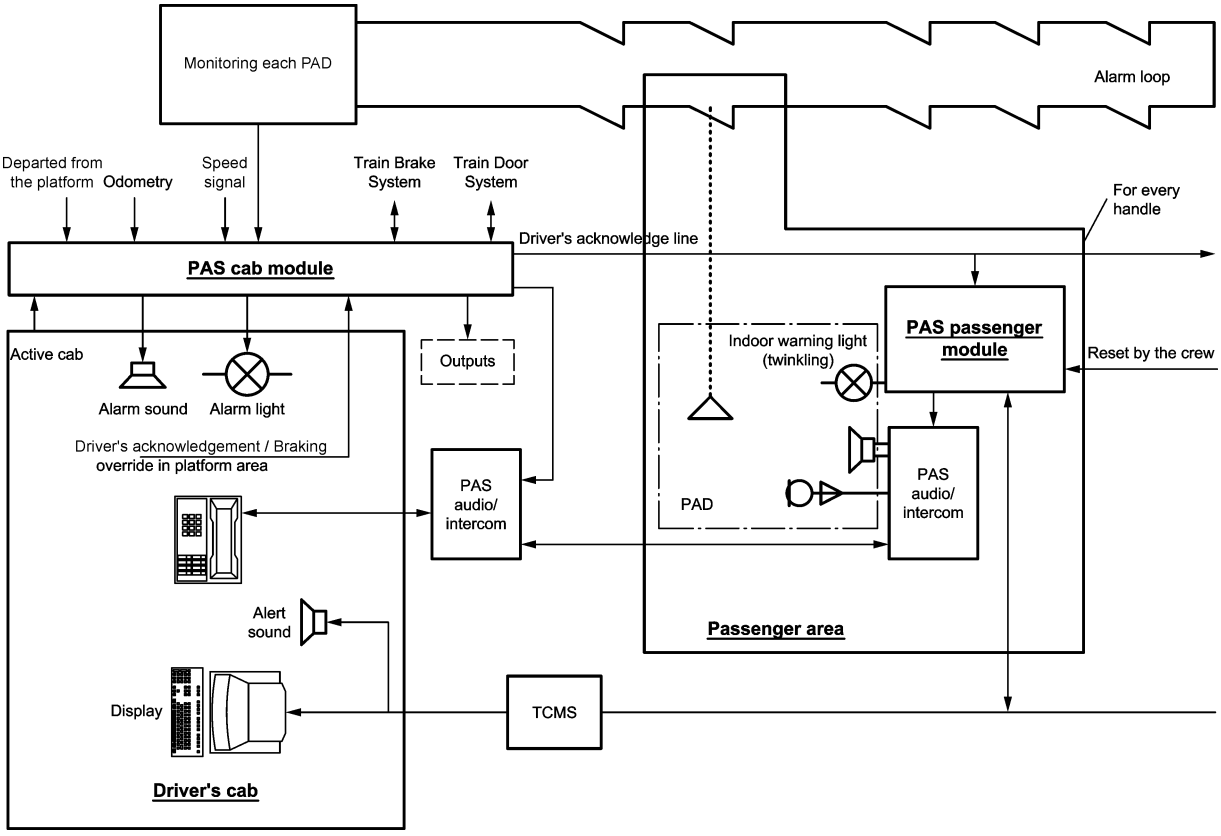


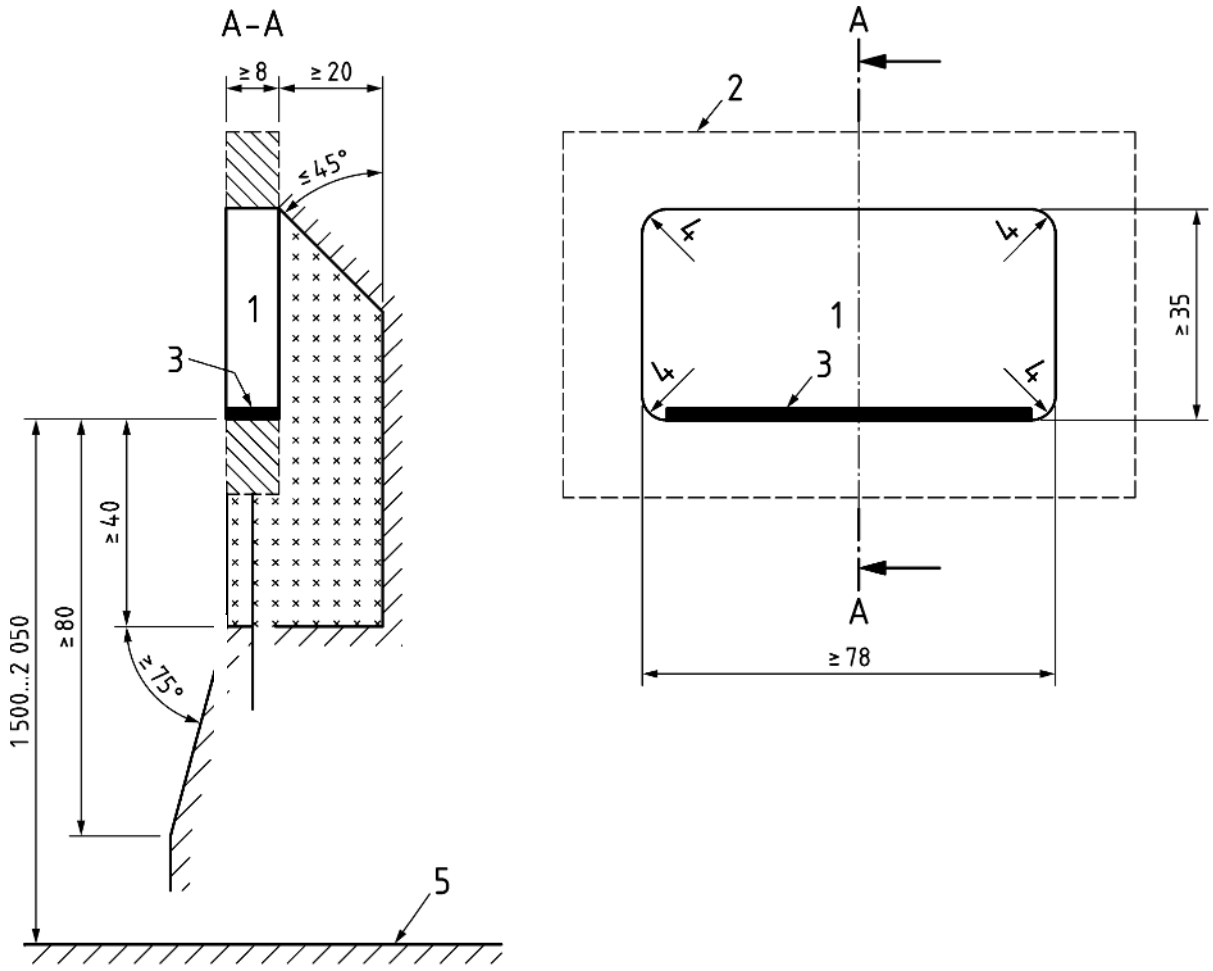
Figure E.2 — PAS architecture – Subsystems example

Annex F
(normative)

Overall dimension of the PAD handle interface

Figure F.1 shows the overall dimensions of the PAD handle interface.

Dimensions in millimetres



Key

1 free area within the PAD
2 PAD envelope (not mandatory)
3 hand contact area
4 any edge radius allowed
5 top of floor
free area for fingers behind and below the PAD

NOTE PAD operation can be vertical or allow rotational movement.

Figure F.1 — Overall dimensions of the PAD handle and enclosure space envelope

Annex G
(informative)

Inscription indicating the PAD

Figure G.1 shows the inscription in 4 languages with Italian as the 4th language as an example.

Figure G.1 — Inscription in four languages

Figure G.2 shows the inscription in 5 languages, including the national language.

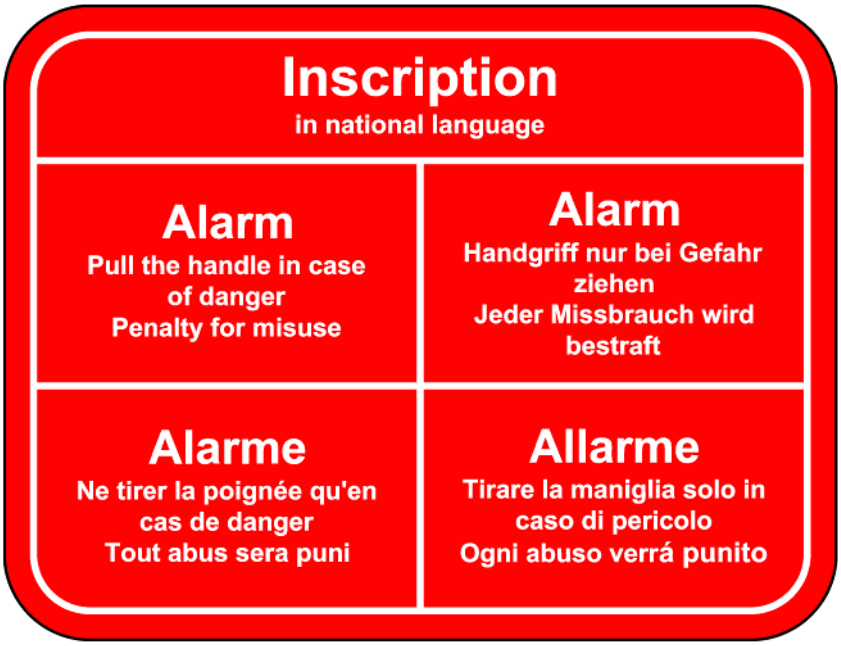
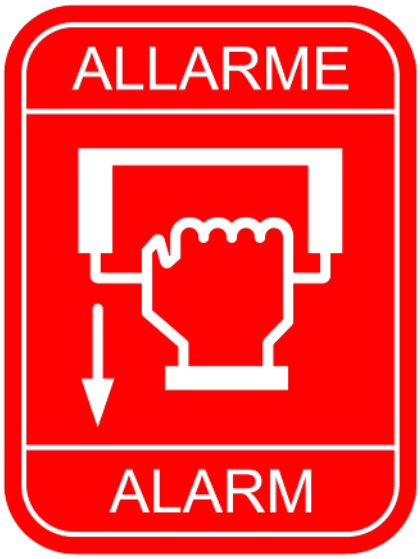


Figure G.2 — Inscription in 5 languages – including the national language

Annex H
(informative)

Label for PAD

If a label with a logo is used instead of those defined in Annex G, the following picture is recommended:



National language(s)

English

Figure H.1 — Label for PAD. Type 1

Figure H.2 — Label for PAD. Type 2

Figure H.3 — Label for PAD. Type 3

Annex I
(informative)

Degraded mode

Top level PAS degraded modes management and train operating modes

In Table I.1, the column 'PAS behaviour requirements' describes the possible behaviour of the system and the column 'Additional features' describes some additional features of the PAS that may be available in that degraded mode.

NOTE Additional features are not specific to the EN, the operating rules in degraded modes will need to be determined before designing some of these options.

Any isolated part of the PAS may be permanently indicated to the driver in the active cab by the TCMS.

Table I.1 – Top level PAS degraded mode management

Train operating mode	PAS status	PAS Users	Users actions	PAS behaviour	Active interface	Additional features
Rescue (degraded mode, no electrical connection, mechanical and pneumatic coupled)	degraded mode	Any	Pulling a PAD No driver action possibility	Communication link not active Driver override not available	None	May request to apply the brake Pulling a PAD may request directly a brake application if the PAS architecture and the brake system are compatible. For example: for UIC brake system, the direct brake application should be possible.
Non-driving vehicle without electrical energy (for instance a coach)	degraded mode	Any	Pulling a PAD	Request PAS cab module to request brake application Some local PAS functions may not be available: lights, etc. Communication link may not be active	None	The driver only partially knows what is happening in the train (for example may not be able to determine where the request is coming from). No conversation possible with the passenger. Driver override may not be available on the vehicle without electrical power.
All train modes	PAS communication system isolated	Any	Any	Communication link not active	PAS communication system outputs not available	Indication to the driver of PAS communication link isolated by TCMS may be available.
All train modes	PAS cab subsystem isolated Degraded mode	Any	Pulling a PAD	Indication to the driver: PAS isolated Direct application of brakes Override may be active, depending on the PAS architecture.	PAS cab subsystem outputs not available	Override may still be active, as a redundant system: for example direct link between 'override button' in the cab and the PAS passenger systems.
All train modes	One PAS passenger subsystem isolated Degraded mode	Any	Pulling a PAD	All local PAS passenger subsystem functions unavailable: No response to the PAD being operated.	No local PAS passenger subsystem outputs active	The passenger will have to use another still active PAD. TCMS may indicate the isolated PAD to the driver.

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC

This European Standard has been prepared under a mandate given to CEN/CENELEC/ETSI by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2008/57/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in Table ZA.1, Table ZA.2 and Table ZA.3 for the current TSIs at the time of the publication of this standard and Table ZA.4 and Table ZA.5 for the new approved TSIs, within the limits of the scope of this standard, give a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 – Correspondence between this European Standard, the HS TSI RST published in the OJEU dated 26 March 2008 and Directive 2008/57/EC

Clause/subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard applies (see column comments)	4. Characterisation of the subsystem 4.2 Functional and technical specification of the subsystem 4.2.5 Passenger information and communication 4.2.5.3 Passenger alarm	Annex III, Essential requirements 1 General requirements 1.1 Safety Clauses 1.1.1 1.5 Technical compatibility 2 Requirements specific to each subsystem 2.4 Rolling stock 2.4.1 Safety §5, §8, §10 2.4.2 Reliability and availability 2.4.3 Technical compatibility §3	This TSI requires that the activation of the PAS initiate braking that can be overridden by the driver in order to stop the train in a convenient place. This EN is based on the fact that activation of PAS shall not initiate braking (except in platform areas) in order to allow the driver to keep control of the train. This table will be obsolete with the publication of the TSI “LOC and PAS” and superseded by the Table ZA.4.

Table ZA.2 – Correspondence between this European Standard, the CR TSI Locomotives and Passenger RST (CR Loc and Pass TSI) published on 26.05.2011 in the OJEU and Directive 2008/57/EC

Clause/subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard applies	4.Characterization of the Rolling stock subsystem 4.2 Functional and technical specifications of the subsystem 4.2.5 Passenger related items §4.2.5.3 Passenger alarm: functional requirements §4.2.5.4 Safety instructions to passengers – Signs §4.2.5.5 Communication devices for passengers	Annex III, Essential requirements 1 General requirements 1.1 Safety Clauses 1.1.1 1.5 Technical compatibility 2 Requirements specific to each subsystem 2.4 Rolling stock 2.4.1 Safety §5, §8, §10 2.4.2 Reliability and availability 2.4.3 Technical compatibility §3	This table will be obsolete with the publication of the TSI "LOC and PAS" and superseded by the Table ZA.4

Table ZA.3 – Correspondence between this European Standard, the SRT TSI published in the OJEU dated 7 March 2008 and Directive 2008/57/EC

Clause/subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard applies (see column comments)	4.Characterization of the subsystem 4.2 Functional and technical specifications of the subsystem 4.2.5. Subsystem rolling stock 4.2.5.8 Emergency brake override	Annex III, Essential requirements 1 General requirements 1.1 Safety Clauses 1.1.1 1.5 Technical compatibility 2 Requirements specific to each subsystem 2.4 Rolling stock 2.4.1 Safety §5, §8, §10 2.4.2 Reliability and availability 2.4.3 Technical compatibility §3	This TSI refers to HS RST TSI which requires that the activation of the PAS initiate braking that can be overridden by the driver in order to stop the train in a convenient place. This EN is based on the fact that activation of PAS shall not initiate a braking (except in platform areas) in order to allow the driver to keep control of the train. This table will be obsolete with the publication of the TSI "LOC and PAS" and superseded by the Table ZA.5.

Table ZA.4 – Correspondence between this European Standard, the TSI Locomotive and Passenger Rolling Stocks (approved by the RISC68 on 23 October 2013) and Directive 2008/57/EC

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard applies	4.2 Functional and technical specification 4.2.5.3 Passenger alarm §4.2.5.3.1 General §4.2.5.3.2 Requirements for information interfaces §4.2.5.3.3 Requirements for activation of the brake by the passenger alarm §4.2.5.3.4 Criteria for a train departing from a platform §4.2.5.3.5 Safety requirements §4.2.5.3.6 Degraded mode	Annex III, Essential requirements 1 General requirements 1.1 Safety Clauses 1.1.1 1.5 Technical compatibility 2 Requirements specific to each subsystem 2.4 Rolling stock 2.4.1 Safety §5, §8, §10 2.4.2 Reliability and availability 2.4.3 Technical compatibility §3	The liaison between ETCMS and the PAS for the platform detection as requested in 4.2.5.3.4 of the TSI is not covered by this EN

Table ZA.5 – Correspondence between this European Standard, the TSI SRT (approved by the RISC68 on 23 October 2013) and Directive 2008/57/EC

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard applies	4.2 Functional and technical specifications of subsystem 4.2.3 Subsystem rolling stock 4.2.3.3 Requirements related to emergencies 4.2.3.3.3 Passenger alarm and communication means	Annex III, Essential requirements 1 General requirements 1.1 Safety Clauses 1.1.1 1.5 Technical compatibility 2 Requirements specific to each subsystem 2.4 Rolling stock 2.4.1 Safety §5, §8, §10 2.4.2 Reliability and availability 2.4.3 Technical compatibility §3	

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Bibliography

[1] CR LOC and PAS TSI, *Locomotives and passenger rolling stock subsystem* (2011/291/EU)

[2] UIC 541-6, *Brakes — Electropneumatic brake (ep brake) and Passenger alarm signal (PAS) for vehicles used in hauled consists*

[3] TSI PRM, *Persons with reduced mobility (2008/164/EC)*

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