BS ISO 4273:2024

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Intelligent transport systems — Automated braking during low-speed manoeuvring (ABLS) — Requirements and test procedures

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2024

ISBN 978 0 539 17109 9

ICS 03.220.20; 35.240.60

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2024.

Amendments/corrigenda issued since publication

Date	Text affected

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International Standard

ISO 4273

First edition
2024-01

Intelligent transport systems — Automated braking during low-speed manoeuvring (ABLS) — Requirements and test procedures

Systèmes de transport intelligents — Freinage automatique lors de manœuvres à basse vitesse (ABLS) — Exigences et procédures d'essai

Reference number
ISO 4273:2024(en)

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Published in Switzerland

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Existing International Standards for automated emergency braking, such as ISO 22839 or ISO 19237, are focused on collision mitigation or avoidance at moderate vehicle speeds in the forward direction, typically using front sensors such as radar. The implementation and utilization of additional perception sensors (i.e. around the entire vehicle) creates the possibility of advanced collision mitigation and avoidance systems covering the whole area surrounding the vehicle.

Low-speed collisions during parking and especially during reversing manoeuvres represent a high share of road traffic accidents, including both accidents with material damage leading to high monetary expenses,[6] and accidents leading to injuries or even fatalities of human road users. This document addresses such collisions.

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Intelligent transport systems — Automated braking during low-speed manoeuvring (ABLS) — Requirements and test procedures

1 Scope

This document provides minimum requirements and test procedures for automated braking at velocities below 2,8 m/s (10 km/h) with the specific aim of avoiding or mitigating collisions with pedestrians, other road users (e.g. vehicles) and stationary objects, including infrastructure elements (e.g. walls, pillars). These collisions mainly occur during reversing manoeuvres, but this document also addresses collisions in other directions during low-speed manoeuvring.

Automated braking during low-speed manoeuvring (ABLS) requires information about the position and motion of the object, the motion of the subject vehicle, and the driver actions. It then determines if the evaluated situation represents a collision risk. If an imminent collision risk exists, ABLS will automatically activate a brake action to avoid or at least mitigate the collision.

The document does not define test objects, but refers to the ISO 19206 series for test objects to be used.

The human driver is assumed to perform or at least supervise all driving manoeuvres because the ABLS application is restricted to support only systems of SAE Level 0 – 2. Evasive steering manoeuvres are not within the scope of this document.

This document applies to light vehicles[7] only. Vehicles equipped with trailers are not within the scope of this document.

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.

ISO 17386, *Intelligent transport systems — Manoeuvring aids for low-speed operation (MALSO) — Performance requirements and test procedures*

ISO 19206-2, *Road vehicles — Test devices for target vehicles, vulnerable road users and other objects, for assessment of active safety functions — Part 2: Requirements for pedestrian targets*

ISO 20900:2023, *Intelligent transport systems — Partially-automated parking systems (PAPS) — Performance requirements and test procedures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17386, ISO 19206-2, ISO 20900 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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3.1
ABLS function
function capable of reducing the velocity of the vehicle to avoid or mitigate a collision during low-speed manoeuvring

3.2
ABLS types
types A to C which are related to the automation level of the driving function supported by ABLS

3.3
low-speed manoeuvring
LSM
driving manoeuvre of a vehicle at a velocity ≤ 2,8 m/s (10 km/h) mainly intended to park the subject vehicle

Note 1 to entry: Within the context of this document, continuous forward driving (e.g. in congested situations such as a traffic jam) where the velocity can potentially drop temporarily below 2,8 m/s (10 km/h) is not considered as low-speed manoeuvring.

3.4
vulnerable road user
VRU
human such as a pedestrian or cyclist, independent of age and size

3.5
subject vehicle
SV
vehicle under test in which ABLS is implemented

3.6
parked vehicle
PV
static vehicle that represents the boundary of an adjacent parking space or the obstacle within the driving path

3.7
manual driving
manoeuvre where the driver is in control of longitudinal and lateral movement of the vehicle and which corresponds to SAE Level 0 (no automation)

3.8
assisted parking system
APS
system which supports the driver during parking by controlling the lateral movement/steering of the vehicle and which corresponds to SAE Level 1 (Driver Assistance)

Note 1 to entry: See ISO 16787 for further information on APS.

3.9
partially automated parking system
PAPS
system which supports the driver during parking by controlling both the longitudinal and lateral movement of the vehicle and which corresponds to SAE Level 2 (Partial Automation)

Note 1 to entry: See ISO 20900 for further information on PAPS.

3.10
parking
parking in
manoeuvring into a parking space

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