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Road vehicles — Fully automatic coupling systems 24 V (FACS) for heavy commercial vehicle combinations —

Part 2:

Electrical and pneumatic interface for 50 mm fifth wheel couplings

Véhicules routiers — Dispositifs d'attelage entièrement automatiques (FACS) à 24 V pour ensembles routiers lourds —

Partie 2: Interface électrique et pneumatique pour sellettes d'attelage de 50 mm





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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 40, *Specific aspects for light and heavy commercial vehicles, busses and trailers*.

This second edition cancels and replaces the first edition (ISO 13044-2:2013), which has been technically revised. The main changes compared to the previous edition are as follows:

— changes to the normative references.

A list of all the parts in the ISO 13044 series can be found on the ISO website.

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.

Introduction

This document specifies the integrated electrical and pneumatic connections of an automated fifth wheel coupling system for articulated vehicles and related components.

Fully automated coupling systems improve safety for the driver and for the vehicle combinations. They also improve the work conditions for the driver and reduce cost for the end user.

- a) Higher safety standard is achieved for example by:
 - a reduction of operational accidents,
 - less injured drivers because there is no need for drivers to stay in the dangerous zone between the towing and the towed vehicle while uncoupling.
- b) Higher comfort level is achieved for example by:
 - elimination of necessity to access the coupling, landing gears and supply lines,
 - reduction of physical demands when operating the coupling and the landing gears or when climbing on or descending from chassis to manually connect or disconnect the supply lines.
- Cost reduction for end user is achieved for example by:
 - less repair and maintenance of cables and pipes,
 - atik extensio. less inactive periods for the vehicle combination due to less damage and repair,
 - new components create space for future extensions and potentials.

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Road vehicles — Fully automatic coupling systems 24 V (FACS) for heavy commercial vehicle combinations —

Part 2:

Electrical and pneumatic interface for 50 mm fifth wheel couplings

1 Scope

This document specifies the mechanical, electrical/electronic and pneumatic characteristics of a fully automated fifth wheel coupling system to ensure interchangeability between a towing vehicle and a coupled semi-trailer(s) with 24 V nominal supply voltage. The two vehicles together constitute an articulated vehicle or are part of a vehicle combination.

This document also supports the step-by-step introduction of fully automated fifth wheel coupling systems in the market. It specifies features necessary for mixed mode operation, i.e. the combination of a fully automated coupling system (FACS) equipped towing vehicle with a conventional semi-trailer, and vice versa, the combination of a conventional towing vehicle with a FACS-equipped semi-trailer.

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 337, Road vehicles — 50 semi-trailer fifth wheel coupling pin — Basic and mounting/interchangeability dimensions

ISO 1726-1, Road vehicles — Mechanical coupling between tractors and semi-trailers — Part 1: Interchangeability between tractors and semi-trailers for general cargo

ISO 1726-2, Road vehicles — Mechanical couplings between tractors and semi-trailers — Part 2: Interchangeability between low-coupling tractors and high-volume semi-trailers

ISO 3842, Road vehicles — Fifth wheels — Interchangeability

ISO 6150:2018, Pneumatic fluid power — Cylindrical quick-action couplings for maximum working pressures of 1 MPa, 1,6 MPa, and 2,5 MPa (10 bar, 16 bar and 25 bar) — Plug connecting dimensions, specifications, application guidelines and testing

ISO 7638-1:2018, Road vehicles — Connectors for the electrical connection of towing and towed vehicles — Part 1: Connectors for braking systems and running gear of vehicles with 24 V nominal supply voltage

ISO 11992 (all parts), Road vehicles — Interchange of digital information on electrical connections between towing and towed vehicles

ISO 12098:2020, Road vehicles — Connectors for the electrical connection of towing and towed vehicles — 15-pole connector for vehicles with 24 V nominal supply voltage

ISO 13044-1, Road vehicles — 24 V fully automatic coupling systems (FACS) for heavy commercial vehicle combinations — Part 1: General requirements and definitions

ISO 16750-3:2012, Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 3: Mechanical loads

ISO 16750-5, Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 5: Chemical loads

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13044-1 and the following apply.

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

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

3.1

fully automated coupling system

FACS

coupling and uncoupling system where all operations, i.e. mechanical, electrical, pneumatic and applicable auxiliary functions, are performed automatically, enabling the coupling and uncoupling process to be completed without direct manual intervention

[SOURCE: ISO 13044-1:2012, 3.3.1.3]

3.2

electrical/electronic-pneumatic interface module

EPI module

component, combining all electrical/electronic and pneumatic connections in one mating unit, consisting of two complementary parts, the *EPI plug module* (3.2.1) and the *EPI socket module* (3.2.2)

3.2.1

EPI plug module

part of the *EPI module* (3.2) containing the electric male contacts, pneumatic male connections and the alignment pins, it is permanently attached to the king pin side mounted on the *semi-trailer* (3.2.3)

3.2.2

EPI socket module

part of the *EPI module* (3.2) containing the electric female contacts, pneumatic female connections and the alignment sockets, it is permanently attached to the fifth wheel which is mounted to the tractor vehicle

3.2.3

semi-trailer

towed vehicle which is designed to be coupled to either a towing vehicle or to a dolly, and to impose a substantial vertical load either on the towing vehicle or on the dolly

3.2.4

alignment device

device placed on the trailer-side, which makes contact to the fifth wheel throat during the coupling process and centres the EPI plug relative to the EPI socket

4 Requirements

4.1 General

In order to guarantee the best functionality, comfort and safety, the use of FACS is recommended in combination with spring-brake equipped semi-trailers only. FACS does not exonerate the driver from ensuring the semi-trailer is correctly parked before coupling or uncoupling.

In order to guarantee best functionality, comfort and safety, the use of FACS is recommended for towing vehicles with height adjustable air-suspension at least on the rear axle.