

Proposal for amendments to Regulation No. 13 (Heavy vehicle braking)

The text reproduced below was prepared by the experts from Sweden to be inserted into Regulation No.13. This is to produce a robust text structure with respect to Brake Electric/Electronic Interface to ensure that the evolving new technology may be handled safely and without risk for misunderstanding. Examples of such new technologies are Fully Automatic Coupling Systems, FACS, and fully integrated drivetrain control including propulsion and braking implemented in the towed vehicles. The modifications to the existing text of the Regulation are marked in **bold** characters. As the proposal for text revision under section "A" is fairly extensive it is recommended to start reading section "B Justification" starting on page.

A. PROPOSAL

Main text

Insert new paragraph 2.34., to read:

"2. DEFINITIONS"

- 2.34. **"Brake electric/electronic interface": A dedicated and unique bundle for all braking system related electric signals within the electric connection between towing and towed vehicle. This bundle shall include the following signals:**
1. **Plus electrovalve (Braking)**
 2. **Plus electronics (Braking)**
 3. **Minus electronics (Braking)**
 4. **Minus electrovalve (Braking)**
 5. **Warning device (Braking; open connection on the towing vehicle during normal operation)**
 6. **CAN_H (Braking; in accordance with ISO11992-1 and ISO11992-2)**
 7. **CAN_L (Braking; in accordance with ISO11992-1 and ISO11992-2)**

Amend paragraph 5.1.3.6., to read:

"5. SPECIFICATIONS"

- 5.1.3.6 ... point-to-point type ~~using the seven pin connector according to ISO 7638-1 or ISO 7638-2:1997.~~ **within the Brake electric/electronic interface.** The data contacts of the ~~ISO 7638 connector~~ **signals within the Brake electric/electronic interface** shall be used to ... " "... The power supply, provided by the ~~ISO 7638 connector~~ **Brake electric/electronic interface**, shall be used ... "

Insert new paragraph 5.1.3.6.0 and 5.1.3.6.0.x, to read:

- 5.1.3.6.0 The Brake electric/electronic interface shall in the physical realization be kept together in a separate region of the electric connection.**

This dedicated region may not be used for anything else than signals concerned with brakes and running gear.

The data signals (6 and 7) of the Brake electric/electronic interface may be left uninstalled provided that physical arrangements are made such that towed vehicles requiring connection according to ISO 11992-1 and 11992-2 may not be connected.

The signal 1 and 4 of the Brake electric/electronic interface shall be physically realized such that leads with 4 mm² cross section may be used.

The connector in which the Brake electric/electronic interface is a part shall per se fulfill the requirements in the ISO4091.

5.1.3.6.0.1 A Brake electric/electronic interface used together with tradition mechanical couplings where the electric connection is engaged by hand shall be realized using the ISO7638-1/ISO7638-2 connector.

5.1.3.6.0.2 A Brake electric/electronic interface that is part of a fully integrated electrical connector used in FACS (Fully Automatic Coupling System) where the electric connection is engaged automatically as part of the automatic process shall be realized in accordance with ISO13044-x or alternatively to the satisfaction of the technical service be proven to fulfill the above requirements and to exclude any possibility for incorrect signal mating.

[*Example of a future possible amendment:*

5.1.3.6.0.3 A Brake electric/electronic interface that is used in a vehicle combination having an integrated vehicle combination control system including advanced propulsion and handling systems in the trailer shall to the satisfaction of the technical service be proven to fulfill the above requirements and to exclude any possibility for incorrect signal mating.]

Amend paragraph 5.2.1.23., to read:

5.2.1.23. "... an anti-lock system shall ~~also be equipped with a special electrical connector, conforming to ISO 7638:1997 7/~~ **have an electric connection realizing the Brake electric/electronic interface as defined in this regulation,** for the ... "

Delete foot note 7/ on page 31.

~~7/ The ISO 7638:1997 connector may be used for 5 pin or 7 pin applications, as appropriate.~~

Amend paragraph 5.2.1.29.2., to read:

5.2.1.29.2. " ... The signal shall be activated from the ~~trailer via pin 5 of the electric connector conforming to ISO 7638:1997 9/~~ **towed vehicle via the signal 5 of the Brake electric/electronic interface as defined in this regulation** and in all cases ... "

Delete foot note 9/ on page 39.

~~9/ The ISO 7638:1997 connector may be used for 5 pin or 7 pin applications, as appropriate.~~

Amend paragraph 5.2.2.15.2.1., to read:

5.2.2.15.2.1. "... addressed by this Regulation and failures of energy supply available from the ~~ISO 7638:1997 15/ connector~~ **through the Brake electric/electronic interface** shall be indicated to the driver by the separate warning signal specified in § 5.2.1.29.2.1 ~~via pin 5 of the electrical connector conforming to ISO 7638:1997 15/~~ **signal 5 of the Brake electric/electronic interface as defined in this regulation.** In addition ... "

Delete foot note 15/ on page 47.

~~15/ The ISO 7638:1997 connector may be used for 5 pin or 7 pin applications, as appropriate.~~

Amend paragraph 5.2.2.16., to read:

5.2.2.16. "...The separate yellow warning signal specified in paragraph 5.2.1.29.2. shall also be activated via ~~pin 5 of the electrical connector conforming to ISO 7638:1997 15/~~ **the signal 5 of the Brake electric/electronic interface as defined in this regulation,** to indicate to the driver ... "

Amend paragraph 5.2.2.17., to read:

5.2.2.17. " ... anti-lock system, shall be fitted with a special electrical connector for the braking system ~~and/or anti lock system, conforming to ISO 7638:1997 15/~~ **have an electric connection realizing the Brake electric/electronic interface as defined in this regulation** 16/. Failure warning signals required from the trailer by this Regulation shall be activated via the ~~above connector~~ **Brake electric/electronic interface**. The requirement to be applied to trailers with respect to the transmission of failure warning signals shall be those, as appropriate, which are prescribed for motor vehicles in paragraphs 5.2.1.29.4., 5.2.1.29.5. and 5.2.1.29.6.

Trailers ~~equipped with an ISO 7638:1997 connector as defined above~~ **having an electric connection as defined above realizing the Brake electric/electronic interface as defined in this regulation** shall be marked in indelible form to indicate the functionality of the braking system when the **Brake electric/electronic interface** is connected and disconnected. The marking is to be positioned so that it is visible when connecting the pneumatic and electrical interface connections. "

Amend foot note 16/ on page 47.

"The wiring specifications of ~~ISO 7638:1997~~ **realizing the Brake electric/electronic interface as defined in this regulation** for the trailer not equipped with an electric control transmission may be reduced if the trailer is installed ... "

Amend paragraph 5.2.2.17.1., to read:

5.2.2.17.1. "...stability system indicate the failure by the separate yellow warning signal specified in paragraph 5.2.1.29.2. above via ~~pin 5 of the ISO 7638:1997 connector~~ **the signal 5 of the Brake electric/electronic interface as defined in this regulation.** "

5.2.2.17.2. "It is permitted to connect the braking system to a power supply in addition to that available from the ~~ISO 7638:1997 connector above~~ **Brake electric/electronic**

interface. However, when an additional power supply is available the following provisions will apply:

- (a) In all cases the ~~ISO 7638:1997~~ **Brake electric/electronic interface** power supply is the primary power source for the braking system, irrespective of any additional power supply that is connected. The additional supply is intended to provide a backup should a failure of the ~~ISO 7638:1997~~ **Brake electric/electronic interface** power supply occur.

...

- (c) In the event of a failure of the ~~ISO 7638:1997~~ **Brake electric/electronic interface** power supply the energy consumed by the braking system shall not result in the maximum available power from the additional supply being exceeded.

...

- (g) Should a failure exist within the electrical supply of energy from the ~~ISO 7638:1997~~ **Brake electric/electronic interface** the requirements of paragraphs 5.2.2.15.2.1. and 4.1. of Annex 13 with respect to failure warning shall apply irrespective of the operation of the braking system from the additional power supply. "

Amend paragraph 5.2.2.18., to read:

5.2.2.18. "...power supplied by the ~~ISO 7638:1997 connector~~ **Brake electric/electronic interface** is used for the functions defined ... "

Amend paragraph 5.2.2.20., to read:

5.2.2.20. "...specified in paragraph 5.2.1.29.2. shall be activated via ~~pin 5 of the ISO 7638:1997 17/ connector~~ **signal 5 of the Brake electric/electronic interface as defined in this regulation.** In addition, trailers ... "

Delete foot note 17/ on page 49.

~~17/ The ISO 7638:1997 connector may be used for a 5 pin or 7 pin applications, as appropriate.~~

Annex 6

Amend paragraph 3.4.1., to read:

3.4.1 "... shall provide the appropriate information to the trailer via ~~pins 6 and 7 of the ISO 7638:1997 connector~~ **signals 6 and 7 of the Brake electric/electronic interface as defined in this regulation.** For the ... "

Amend paragraph 3.5.1.1., to read:

3.5.1.1. "...be checked with the electrical power supplied to the trailer via the ~~ISO 7638:1997 connector (5 or 7 pin)~~ **Brake electric/electronic interface (signal 5 or 7)** "

Annex 6., Appendix, amend the text of Example 3 page 91, to read:

" ... ECL = electric control line corresponding to ISO 7638 **or the Brake electric/electronic interface** ..."

Annex 10, amend the foot note 1/ on page 106, to read:

"... shall only apply when the trailer is electrically connected to the towing vehicle by ~~the ISO 7638:1997 connector~~ **an electric connection realizing the Brake electric/electronic interface as defined in this regulation.** "

Annex 13

Amend paragraph 4.2., to read:

4.2. "...used for this purpose, activated via ~~pin 5 of the electrical connector conforming to ISO 7638:1997 4/~~ **signal 5 of the Brake electric/electronic interface as defined in this regulation.** "

Delete the foot note 4/ on page 185:

~~4/ The ISO 7638:1997 connector may be used for 5 pin or 7 pin applications, as appropriate.~~

Annex 17

Amend paragraph 1.2., to read:

1.2. " The references to ~~ISO 7638~~ **Brake electric/electronic interface** within this annex apply to ~~ISO 7638 1:1997 for 24V applications and ISO 7638 2:1997 for 12V applications~~ **to an electric connection realizing the Brake electric/electronic interface as defined in this regulation whether it concerns 12V or 24V installations** "

Amend paragraph 3.1.1., to read:

3.1.1. "...have a ~~connector meeting ISO 7638:1997 (7 pin)~~ **an electric connection realizing the Brake electric/electronic interface as defined in this regulation (signal 7)** to connect to the vehicle under test. ~~Pins 6 and 7 of the connector~~ **Signal 6 and 7 of the Brake electric/electronic interface** shall be used to transmit and receive messages complying with ISO 11992:2003 "

Amend paragraph 3.2.2., to read:

3.2.2. "...the simulator connected to the motor vehicle via the ~~ISO 7638 interface~~ **Brake electric/electronic interface** and whilst all ... "

Amend paragraph 3.2.2.3.1., to read:

3.2.2.3.1. "Simulate a permanent failure in the communication line to ~~pin 6 of the ISO 7638 connector~~ **through signal 6 of the Brake electric/electronic interface as defined in this regulation** and check that the ... "

Amend paragraph 3.2.2.3.2., to read:

3.2.2.3.2. "Simulate a permanent failure in the communication line to ~~pin 7 of the ISO 7638 connector~~ **through signal 7 of the Brake electric/electronic interface as defined in this regulation** and check that the ... "

Amend paragraph 4.1.1., to read:

4.1.1. "...have a connector meeting ~~ISO 7638:1997 (7 pin)~~ **an electric connection realizing the Brake electric/electronic interface as defined in this regulation (signal 7)** to connect to the vehicle under test. ~~Pins 6 and 7~~ **Signal 6 and 7 of the connector Brake electric/electronic interface** shall be used to transmit and receive messages complying with ISO 11992:2003 "

Amend paragraph 4.2.2., to read:

4.2.2. "...the simulator connected to the motor vehicle via the ~~ISO 7638 interface~~ **Brake electric/electronic interface** and whilst all ... "

Amend paragraph 4.2.2.1.2., to read:

4.2.2.1.2. " ...

EBS 12, Byte 3, Bit 1-2	Pressure in the brake chambers or reaction of the trailer
01 _b	0 kPa (service brake released)
00 _b	The trailer is automatically braked to demonstrate that the combination is not compatible. A signal should also be transmitted via Pin 5 of the ISO 7638:1997 connector signal 5 of the Brake electric/electronic interface as defined in this regulation (yellow warning).

Amend paragraph 4.2.2.2.1.1., to read:

4.2.2.2.1.1. "...A signal should also be transmitted via ~~pin 5 of the ISO 7638 connector~~ **signal 5 of the Brake electric/electronic interface as defined in this regulation** (yellow warning). "

Amend paragraph 4.2.2.2.1.2., to read:

4.2.2.2.1.2. "Reduce the voltage on ~~pin 5 of the ISO 7638 connector~~ **of signal 1 and 2 of the Brake electric/electronic interface as defined in this regulation** to below a value A signal should also be transmitted via ~~pin 5 of the ISO 7638 connector~~ **signal 5 of the Brake electric/electronic interface as defined in this regulation** (yellow warning). "

Amend paragraph 4.2.2.2.1.3., to read:

4.2.2.2.1.3. "...A signal should also be transmitted via ~~pin 5 of the ISO 7638 connector~~ **signal 5 of the Brake electric/electronic interface as defined in this regulation** (yellow warning). "

Annex 19, Appendix 6, amend paragraph 2.3., to read:

2.3. "Methods of powering: ~~ISO 7638~~ **the Brake electric/electronic interface as defined in this regulation**, ISO 1185 etc. "

B. JUSTIFICATION

Summary of the proposal

- 1) Introduce a definition of the “Brake electric/electronic interface”. This definition includes the signals currently managed through the ISO7638 connector.
- 2) Introduce a requirement stating when the “Brake electric/electronic interface” shall be handled with the ISO7638 connector and when and how it may be handled through other means.
- 3) Exchange in the main text all references to the ISO7638 with “Brake electric/electronic interface”.
- 4) Delete all footnotes commenting the difference between 5-pin and 7-pin ISO7638 connectors. This is a matter to be handled once in the requirement of when the ISO7638 connector shall be used.

Detailed justification of the proposal

New technologies like Fully Automated Coupling Systems, FACS are introduced into the market. These technologies address Safety, Efficiency, Environment and Work related illness. The connector ISO7638 is incompatible with FACS. Further details and motives for FACS may be found in a supplementary document to this proposal.

Further examples of system solutions down the line that will be incompatible with the ISO7638 are "fully integrated vehicle combination control systems". Those may include advanced propulsion, stability and handling systems implemented in the trailers. Some information on the project with this content may be found a supplementary document to this proposal.

Regulation No. 13 is requiring the use of ISO7638 which is incompatible with the above applications. In order to allow for those applications and other to be handled in a safe way a definition of a “Brake electric/electronic interface” is introduced. The definition of the “Brake electric/electronic interface” gives a nomenclature that was lacking for brake system related signals. Hence all references to ISO7638 in the bulk text of ECE R13 is exchanged for references to relevant parts of the definition of the “Brake electric/electronic interface”.

The deletion of all the footnotes concerning pin 5 and 7 is justified through the fact that in this proposal the details of the physical realization is the subject of a separate paragraph, e.g. 5.1.3.6.0.1.

Further, paragraphs 5.1.3.6.0. and 5.1.3.6.0.x are introduced to layout the physical requirements on the realization (embodiment) of the “Brake electric/electronic interface”. In addition the alternative embodiments with respect to different applications are outlined.

As new technologies and systems are coming to the market, the definition of “Brake electric/electronic interface” may need to be updated and then an additional paragraph 5.1.3.6.0.x be added. The remainder of the regulation will be unchanged as regards “Brake electric/electronic interface”