

Proposed amendment to ECE Regulation 13

The text reproduced below was prepared by the experts of the informal working group ACV for the amendment of Regulation No. 13. This is to enable the use of automatic couplings systems.

The modifications to the existing text of the Regulation are marked in **bold** characters.

I. Proposal

Insert new paragraphs 2.39. and 2.40., to read:

- 2.39. "Brake electric/electronic interface" means the part of a separable electrical/electronic connection between the towing vehicle and the towed vehicle which is dedicated to the braking system and is part of an automated or automatic connector**
- 2.40. "Automated Connector" means a system through which the electrical connection, or the electric and pneumatic connection, between the towing vehicle and towed vehicle is made automatically without direct intervention of a human operator.**

Amend paragraph 5.1.3.6. to read:

- 5.1.3.6. a) The electric control line shall conform to ISO 11992-1 and 11992-2:2003 including its amendment 1:2007 and be a point-to-point type using :
- i) the seven pin connector according to ISO 7638-1 or 7638-2:2003 **or,**
 - ii) **in the case of systems where the connection of the electric control line is automated, the automated connector shall provide as a minimum the same number of pins [with the same electrical conductivity properties and electrical functionality] as the above mentioned ISO 7638 connector and meet the requirements specified in Annex 22 of this Regulation.**
- b) The data contacts of the ISO 7368 connector shall be used to transfer information exclusively for braking (including ABS) and running gear (steering, tyres and suspension) functions as specified in ISO 11992-2:2003 including its Amd.1:2007. The braking functions have priority and shall be maintained in the normal and failed modes. The transmission of running gear information shall not delay braking functions.

- c) The power supply, provided by the ISO 7638 connector, shall be used exclusively for braking and running gear functions and that required for the transfer of trailer related information not transmitted via the electric control line. However, in all cases the provisions of Paragraph 5.2.2.18. of this Regulation shall apply. The power supply for all other functions shall use other measures.

5.1.3.8. Shut-off devices which are not automatically actuated shall not be permitted.

5.1.3.9. In the case of **tractor and semi-trailer articulated-vehicle** combinations, the flexible hoses and cables shall be a part of the power-driven vehicle. In all other cases, the flexible hoses and cables shall be a part of the trailer.

In the case of an automated connector containing only the electrical connections, this requirement regarding the allocation of flexible cables is not applicable.

In the case of an automated connector containing both pneumatic and electrical connections, this requirement regarding the allocation of flexible hoses and cables is not applicable.

Amend paragraph 5.2.1.23. to read:

5.2.1.23. Power driven vehicles authorized to tow a trailer equipped with an anti-lock system shall also be equipped with a special electrical connector, conforming to ISO 7638:2003¹, for the electric control transmission.
Alternatively [or in addition], in the case of systems where the connection of the electric control line is automated, the automated connector shall meet the requirements specified in Annex 22 of this Regulation.

Amend paragraph 5.2.2.17. to read:

5.2.2.17. Trailers equipped with an electric control line and O₃ and O₄ category trailers equipped with an anti-lock system, shall be fitted with a special electrical connector for the braking system and/or anti-lock system, conforming to ISO 7638:2003^{15, 2}. **Alternatively [or in addition], in the case of systems where the connection of the electric control line is automated, the**

¹ The ISO 7638:2003 connector may be used for 5 pin or 7 pin applications, as appropriate.

² The conductor cross sections specified in ISO 7638:2003 for the trailer may be reduced if the trailer is installed with its own independent fuse. The rating of the fuse shall be such that the

³ In the case of a trailer equipped with both an ISO 7638 connector and automated connector, the marking shall show that the ISO 7638 connector should not be connected when an automated connector is in use.

automated connector shall meet the requirements specified in Annex 22 of this Regulation.

Failure warning signals required from the trailer by this Regulation shall be activated via the above connectors. 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 7638:2003 connector as defined above shall be marked in indelible form to indicate the functionality of the braking system when the ISO 7638:2003 connector is connected and disconnected.³

The marking is to be positioned so that it is visible when connecting the pneumatic and electrical interface connections.

Annex 6

- 3.3.3. The simulator shall be set, e.g. through the choice of orifice in accordance with paragraph 3.3.1. of this annex in such a way that, if a reservoir of $385 \pm 5 \text{ cm}^3$ is joined to it, the time taken for the pressure to increase from 65 to 490 kPa (10 and 75 per cent respectively of the nominal pressure of 650 kPa) shall be 0.2 ± 0.01 seconds. If a reservoir of $1155 \pm 15 \text{ cm}^3$ is substituted for the above-mentioned reservoir, the time taken for the pressure to increase from 65 to 490 kPa without further adjustment shall be 0.38 ± 0.02 seconds. Between these two pressure values, the pressure shall increase in an approximately linear way. ~~These reservoirs shall be connected to the coupling head without using flexible pipes and the connection shall have an internal diameter of not less than 10 mm.~~

These reservoirs shall be connected to the coupling head without using flexible pipes. The connection between the reservoirs and the coupling head shall have an internal diameter of not less than 10 mm.

The setting shall be carried out using a coupling head arrangement that is representative of the type fitted to the trailer for which type approval is being sought.

Add Annex 22 to read:

Annex 22

REQUIREMENTS FOR THE BRAKE ELECTRIC/ELECTRONIC INTERFACE

1. General

This annex defines the requirements applicable to installations where the connection and disconnection of the brake electric/electronic interface between the towing vehicle and the towed vehicle is achieved by an automated connector.

2. Requirements

The electric/electronic interface of the automated connector shall achieve the same functional requirements as specified for the ISO 7638 connector throughout this regulation and its annexes.

2.1 The contacts (pins and sockets) for the brake electric/electronic interface shall have the same electrical current carrying capability and functionality as the ISO 7638 contacts.

2.2. Deviating from ISO 11992-1, the maximum permissible cable lengths shall be :

Towing vehicle l_1 : 18m

Coiled cable l_2 : 0 m

Towed vehicle l_3 : 22 m.

2.4. Vehicles being equipped with both a connector conforming to ISO 7638 and an automated connector shall be built in such a way that if unintentionally both connectors are connected, there is no conflict in the functioning of the electric control transmission or in the transmission of information in accordance with ISO 11992-2:2003 including Amendment 1:2007.

[2.4.1. This shall be accomplished automatically. Alternatively, if not accomplished automatically, the trailer brakes must be automatically applied and remain applied until the ISO 7638 connector is disconnected.]

2.5. During or following the coupling process, after a correct mechanical coupling, the driver shall be provided with a haptic (e.g. braked trailer) or optical or acoustic warning if the towing vehicle and towed vehicle parts of the automated connector are not positioned together so as to provide a fully functional connection*.

This warning shall be given not later than two seconds after the motor vehicle has started to move.

***Fully functional means the transfer of air, electrical power and electronic signals as appropriate, as required by this regulation.**

Appendix 1

ELECTRICAL LAYOUT OF AN AUTOMATED CONNECTION BETWEEN
VEHICLES - TRACTOR AND SEMI-TRAILER EXAMPLE

LEGEND

ELECTRICAL

E1	ISO 11992-2 NODE IN TRACTOR, E.G. ECU ABS/EBS
E2	TRACTOR ISO 7638 SOCKET
E3	TRACTOR ISO 7638 PLUG FOR AUTOMATED CONNECTOR
E4	TRACTOR PART OF AUTOMATED CONNECTOR
E5	TRAILER ISO 7638 PLUG FOR AUTOMATED CONNECTOR
E6	TRAILER ISO 7638 SOCKET
E7	TRAILER PART OF AUTOMATED CONNECTOR
E8	ISO 7638 COILED CABLE
E9	ISO 7638 PARK SOCKET
E10	ISO 11992-2 NODE IN TRAILER, E.G. ECU ABS/EBS
I	CABLE FROM E1 TO E2
II	CABLE FROM E3 TO E4
III	CABLE FROM E8 TO E6
IV	CABLE FROM E7 TO E9

PNEUMATIC

P1	TRAILER CONTROL VALVE MOUNTED ON TRACTOR
P2	T-PIECE
P3	PNEUMATIC COILED TUBE (CONTROL AND SUPPLY)
P4	TRACTOR PART OF AUTOMATED CONNECTOR
P5	PNEUMATIC COUPLING HEAD ON TRAILER (CONTROL AND SUPPLY)
P6	PNEUMATIC VALVE TO SEAL THE UNUSED TERMINAL (DOUBLE CHECK VALVE) (CONTROL AND SUPPLY)
P7	TRAILER PART OF AUTOMATED CONNECTOR
P8	PNEUMATIC COILED TUBE (CONTROL AND SUPPLY)
P9	PNEUMATIC PARK SOCKET (CONTROL AND SUPPLY)

I. AUTOMATED CONNECTION AND MANUAL CONNECTION EQUIPPED VEHICLES

Automated connection mode

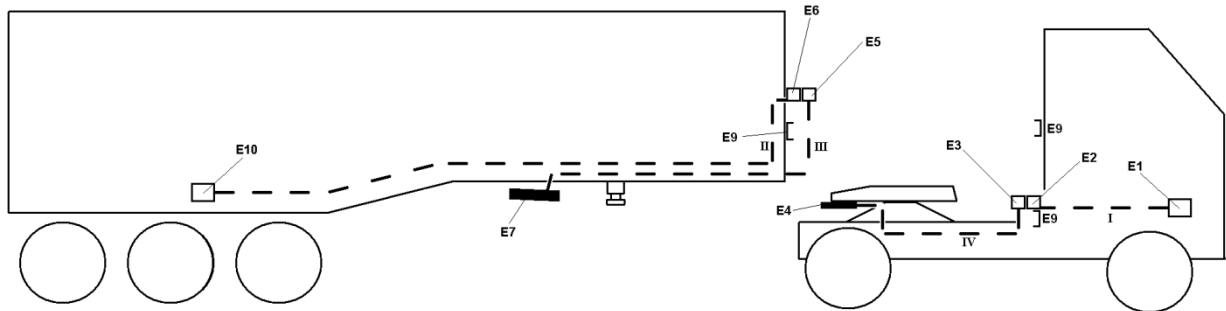


Figure A: Point-to-point connection ECU Tractor (E1) and ECU Trailer (E10) via ACV

Automated connection mode: No coiled cables connected, Connection between E1 and E10 when E4 and E7 are connected (i.e. when fifth wheel coupled)

Manual connection mode

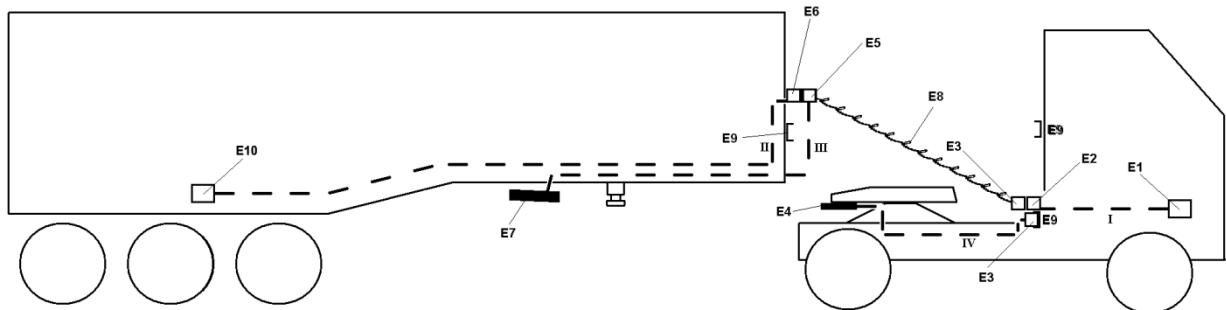


Figure B: Point-to-point connection ECU Tractor (E1) and ECU Trailer (E10) via coiled cable

Manual mode: Coiled cables connected, Connection between E3 and E4 as E5 and E7 are not in use

II. ONLY ONE PART OF THE VEHICLE COMBINATION IS EQUIPPED WITH AN AUTOMATED CONNECTION

Manual mode A (only the tractor equipped with automated connection)

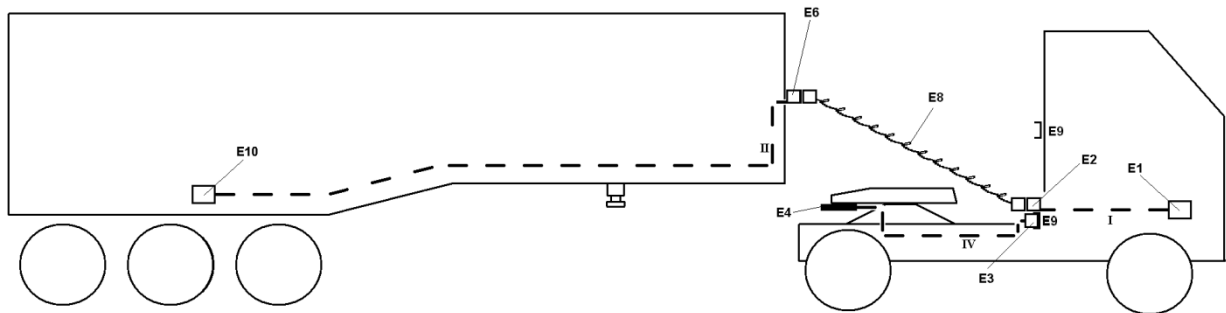


Figure C: Point-to-point connection ECU Tractor (E1) and ECU Trailer (E10) when Fifth Wheel is closed

Coiled cables connected, Line E3 to E4 is not in use

Manual mode B (only the semi-trailer equipped with automated connection)

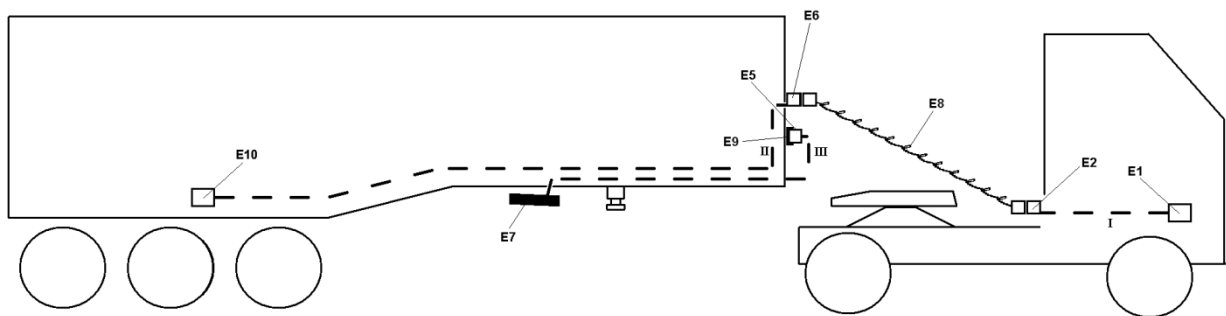
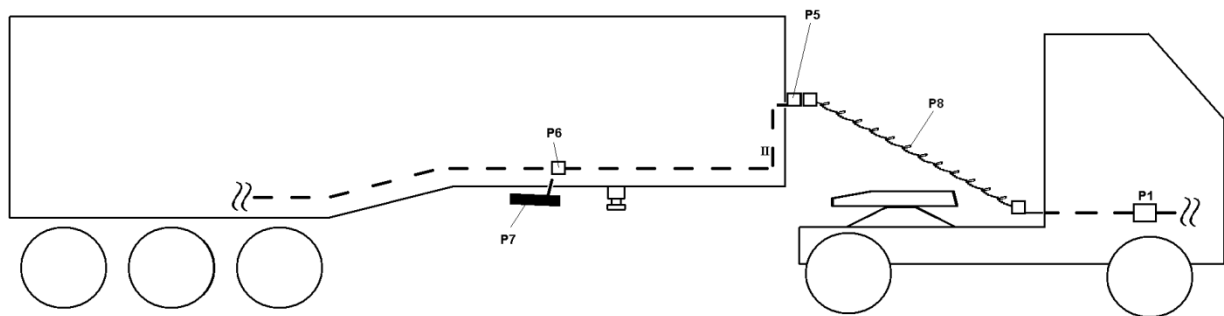
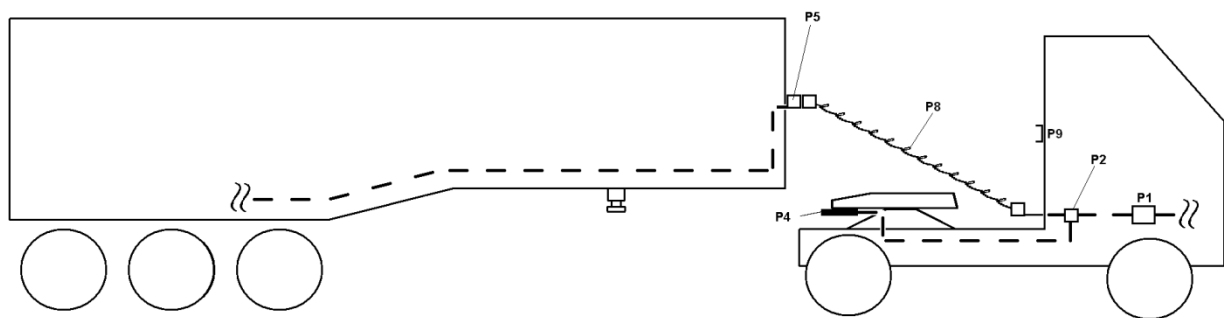
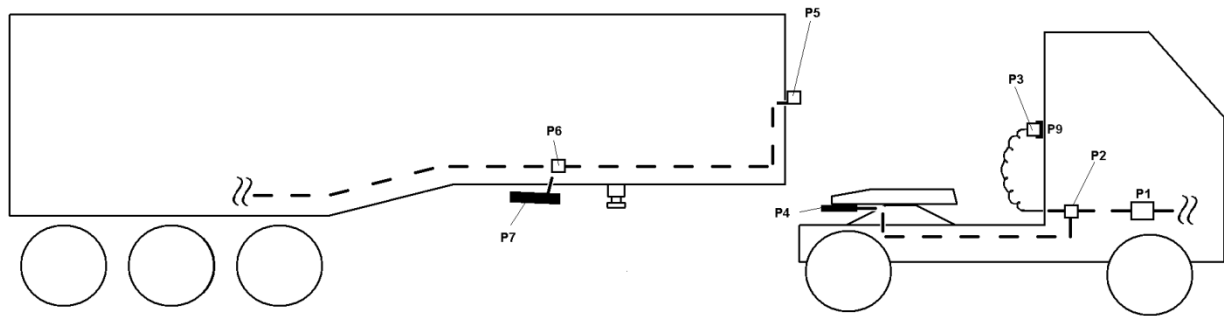


Figure D: Point-to-point connection ECU Tractor (E1) and ECU Trailer (E10)

Coiled cables connected, Line E5 to E7 is not in use

Text still to be added to the pictures below.



JUSTIFICATIONS

Annex 6, paragraph 3.3.3

Clarification of existing method of measuring response time. So that the same principle is applied regardless of coupling head type used.

Clarification that the pipe between the coupling head and the reservoir is not less than 10mm and it is not with regard to the coupling head itself. Proven by a table of measurement results.

Paragraph 5.1.3.9.

Account needs to be taken of the fact that automated connectors do not require a flexible interface between tractor and trailer.