

PROPOSAL FOR AMENDMENT OF ECE REGULATION No. 13

Throughout the Regulation and its annexes, replace the reference to “ISO 11992-1:1998” by the reference to “ISO/DIS 11992-1:2001”

Throughout the Regulation and its annexes, replace the reference to “ISO 11992-2:1998” by the reference to “ISO/DIS 11992-2:2001”

Paragraph 5.1.3.6., amend to read:

“5.1.3.6. The electric control line shall conform to ~~ISO 11992-1 and 11992-2:1998~~ ISO/DIS 11992-1 and 11992-2:2001 and be a point-to-point type using the seven pin connector according to ISO 7638-1 or 7638-2:1997. 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 and 11992-3:1998 (those parameters that are permitted and those that are not permitted, to be transferred by the electric control line, are listed in annex 16 to this Regulation)~~ ISO/DIS 11992-2:2001. 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. 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.”

Paragraph 5.1.3.6.1., amend to read:

5.1.3.6.1. The functional compatibility of towing and towed vehicles equipped with electric control lines as defined above shall be assessed at the time of type approval by checking that the relevant provisions of ~~ISO 11992:1998 parts 1, 2 and 3~~ ISO/DIS 11992:2001 parts 1 and 2 are fulfilled. Annex 17 of this Regulation provides an example of tests that may be used to perform this assessment.

Annex 6

Annex 6, paragraph 3.4., amend to read:

- “3.4. The simulator for checking the response to signals transmitted via the electric control line shall have the following characteristics:
- 3.4.1. The simulator shall produce a digital demand signal in the electric control line according to ~~ISO 11992:1998~~ ISO/DIS 11992:2001 and shall provide the appropriate information to the trailer via pins 6 and 7 of the ISO 7638:1997 connector. For the purpose of response time measurement the simulator may at the manufacturer’s request transmit to the trailer information that no pneumatic control line is present and that the electric control line demand signal is generated from two independent circuits (see paragraph ~~5.4.2.25 and 5.4.2.26 of ISO 11992-2:1998~~ 6.4.2.2.24 and 6.4.2.2.25 of ISO/DIS 11992-2:2001).

Annex 16

Interpretation of ISO 11992-2 and 11992-3:1998 for the Purposes of Paragraph 5.1.3.6. of this Regulation

Annex 16 to be deleted

Annex 17

Test Procedure To Assess The Functional Compatibility Of Vehicles Equipped With Electric Control Lines

1. GENERAL

- 1.1. This annex defines a procedure that may be used to check towing and towed vehicles equipped with an electric control line against the functional and performance requirements referred to in paragraph 5.1.3.6.1. of this Regulation. Alternative procedures may be used at the discretion of the Technical Service if an equivalent level of checking integrity can be established.
- 1.2. The references to ISO 7638 within this annex apply to ISO 7638-1:1997 for 24V applications and ISO 7638-2:1997 for 12V applications.

2. INFORMATION DOCUMENT

- 2.1. The vehicle manufacturer/system supplier shall supply to the Technical Service an Information Document that contains at least the following:
 - 2.1.1. a schematic of the vehicle braking system;
 - 2.1.2. evidence that the interface, including the physical layer, data link layer and the application layer and the respective position of supported messages and parameters, complies with ISO 11992;
 - 2.1.3. a list of supported messages and parameters; and
 - 2.1.4. the specification of the motor vehicle with respect to the number of control circuits that signal the pneumatic and/or electric control lines.

3. TOWING VEHICLES

3.1. ISO 11992 Trailer simulator

The simulator shall:

- 3.1.1. have a connector meeting ISO 7638:1997 (7 pin) to connect to the vehicle under test. Pins 6 and 7 of the connector shall be used to transmit and receive messages complying with ISO 11992;
- 3.1.2. be capable of receiving all of the messages transmitted by the motor vehicle to be type approved and be capable of transmitting all trailer messages defined within ~~ISO 11992 2:1998 and ISO 11992 3:1998, with the exception of those messages specifically prohibited by this Regulation~~ ISO/DIS 11992-2:2001;
- 3.1.3. provide a direct or indirect readout of messages, with the parameters in the data field shown in the correct order relative to time; and
- 3.1.4. include a facility to measure coupling head response time in accordance with paragraph 2.6. of annex 6 to this Regulation.

3.2. Checking procedure

3.2.1. Confirm that the manufacturer's/supplier's information document demonstrates compliance with the provisions of ISO 11992 with respect to the physical layer, data link layer and application layer.

3.2.2. Check the following, with the simulator connected to the motor vehicle via the ISO 7638 interface and whilst all trailer messages relevant to the interface are being transmitted:

3.2.2.1. Control line signalling:

3.2.2.1.1. The parameters defined in EBS 12 byte 3 of ISO 11992-2 shall be checked against the specification of the vehicle as follows:

Control Line Signalling	EBS 12 Byte 3	
	Bits 1 - 2	Bits 5 - 6
Service braking demand generated from one electrical circuit	00b	
Service braking demand generated from two electrical circuits	01b	
Vehicle is not equipped with a pneumatic control line <u>1/</u>		00b
Vehicle is equipped with a pneumatic control line		01b

1/ This specification of vehicle is prohibited by footnote 1/ to paragraph 5.1.3.1.3. of this Regulation.

3.2.2.2. Service/Secondary brake demand:

3.2.2.1.1 The parameters defined in EBS 11 of ISO 11992-2 shall be checked as follows:

Test condition	Byte Reference	Signal Status
Service brake pedal and secondary brake control released	3 - 4	0
Service brake pedal fully applied	3 - 4	33280d to 43520d (6.5 to 8.5bar)
Secondary brake fully applied <u>2/</u>	3 - 4	33280d to 43520d (6.5 to 8.5bar)

2/ Optional on towing vehicles with electric and pneumatic control lines when the pneumatic control line fulfils the relevant requirements for secondary braking

3.2.2.3. Failure warning:

- 3.2.2.3.1. Simulate a permanent failure in the communication line to pin 6 of the ISO 7638 connector and check that the yellow warning signal specified in paragraph ~~5.2.1.29.2.5.2.1.29.1.2.~~ of this Regulation is displayed.
- 3.2.2.3.2. Simulate a permanent failure in the communication line to pin 7 of the ISO 7638 connector and check that the yellow warning signal specified in paragraph ~~5.2.1.29.2.5.2.1.29.1.2.~~ of this Regulation is displayed.
- 3.2.2.3.3. Simulate message EBS 22, byte 2 with bits 3 - 4 set to 01b and check that the red warning signal specified in paragraph 5.2.1.29.1.1. of this Regulation is displayed.

3.2.2.4. Supply line braking request:

For power-driven vehicles which can be operated with trailers connected via an electric control line only:

Only the electric control line shall be connected

Simulate message EBS 22, byte 4 with bits 3 - 4 set to 01b and check that the pressure in the supply line falls to 1.5 bar within the following two seconds.

Simulate a continuous absence of data communication and check that the pressure in the supply line falls to 1.5 bar within the following two seconds.

3.2.2.45. Response time:

- 3.2.2.45.1. Check that, with no faults present, the control line response requirements defined in item 2.6. of annex 6 to this Regulation are met.

3.2.3. Additional checks

- 3.2.3.1. At the discretion of the Technical Service the checking procedures defined above may be repeated with the non-braking functions relevant to the interface in different states or switched off.

4. TRAILERS

4.1. ISO 11992 Towing vehicle simulator

The simulator shall:

- 4.1.1. have a connector meeting ISO 7638:1997 (7 pin) to connect to the vehicle under test. Pins 6 and 7 of the connector shall be used to transmit and receive messages complying with ISO 11992;
- 4.1.2. have a failure warning display and an electrical power supply for the trailer;
- 4.1.3. shall be capable of receiving all of the messages transmitted by the trailer to be type approved and be capable of transmitting all motor vehicle messages defined within ~~ISO 11992 2:1998 and ISO 11992 3:1998, with the exception of those messages specifically prohibited by this Regulation~~ ISO/DIS 11992-2:2001.

- 4.1.4. provide a direct or indirect readout of messages with the parameters in the data field shown in the correct order relative to time; and
- 4.1.5. include a facility to measure brake system response time in accordance with paragraph 3.5.2. of annex 6 to this Regulation.

4.2. Checking procedure

- 4.2.1. Confirm that the manufacturer's/supplier's Information Document demonstrates compliance with the provisions of ISO 11992 with respect to the physical layer, data link layer and application layer.
- 4.2.2. Check the following, with the simulator connected to the trailer via the ISO 7638 interface and whilst all towing vehicle messages relevant to the interface are being transmitted:

- 4.2.2.1. Service brake system function:

- 4.2.2.1.1. The trailer response to the parameters defined in EBS 11 of ISO 11992-2 shall be checked as follows:

The pressure in the supply line at the start of each test shall be > 7 bar and the vehicle shall be laden (the loading condition may be simulated for the purpose of this check).

- 4.2.2.1.1.1. For trailers equipped with pneumatic and electric control lines:

both control lines shall be connected

both control lines shall be signalled simultaneously

the simulator shall transmit message byte 3, bits 5 - 6

of EBS 12 set to 01b to indicate to the trailer that a pneumatic control line should be connected

Parameters to be checked:

Message Transmitted by the Simulator		Pressure at the Brake Chambers
Byte Reference	Status	
3 - 4	0	0 bar
3 - 4	33280d (6.5 bar)	As defined in the vehicle manufacturer's brake calculation

- 4.2.2.1.1.2. Trailers equipped with pneumatic and electric control lines or an electric control line only:

Only the electric control line shall be connected

The simulator shall transmit the following messages:

Byte 3, bits 5 - 6 of EBS 12 set to 00b to indicate to the trailer that a pneumatic control line is not available, and byte 3, bits 1 - 2 of EBS 12 set to 01b to indicate to the trailer that the electric control line signal is generated from two electric circuits.

Parameters to be checked:

Message Transmitted by the Simulator		Pressure at the Brake Chambers
Byte Reference	Status	
3 - 4	0	0 bar
3 - 4	33280d (6.5 bar)	As defined in the vehicle manufacturers brake calculation

For trailers according to paragraph 5.2.2.15.2. of this Regulation which invoke the provisions of paragraph 5.2.1.18.4.2. of this Regulation when a braking performance of at least 30 per cent of the prescribed performance can no longer be ensured the data communication shall be checked as follows:

In the case that a permanent failure within the electric control transmission of the trailer braking system precludes the braking system performance of at least 30 per cent being met, simulate such a failure and check that byte 4, bits 3 - 4 of EBS 22 transmitted by the trailer is set to 01b or data communication is stopped by the trailer.

4.2.2.1.2. For trailers equipped with only an electric control line, the response to messages defined in EBS 12 of ISO 11992-2 shall be checked as follows:

The pneumatic supply line at the start of each test shall be 7 bar.

The electric control line shall be connected to the simulator.

The simulator shall transmit the following messages:

Byte 3, bits 5 - 6 of EBS 12 set to 01b to indicate to the trailer that a pneumatic control line is available.

Byte 3-4 of EBS 11 shall be set to 0 (no service brake demand)

The response to the following messages shall be checked:

EBS 12, Byte 3, Bit 1-2	Pressure in the brake chambers or reaction of the trailer
01b	0 bar (service brake released)
00b	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 (yellow warning).

For trailers according to paragraph 5.2.2.15.2. of this Regulation which invoke the provisions of paragraph 5.2.1.18.4.2. of this Regulation when a braking performance

of at least 30 per cent of the prescribed performance can no longer be ensured the data communication shall be checked as follows:

In the case that a permanent failure within the electric control transmission of the trailer braking system precludes the braking system performance of at least 30 per cent being met, simulate such a failure and check that byte 4, bits 3 - 4 of EBS 22 transmitted by the trailer is set to 01b or data communication is stopped by the trailer.

4.2.2.2. Failure warning

4.2.2.2.1. Check that the appropriate warning message or signal is transmitted under the following conditions:

4.2.2.2.1.1. In the case that ~~Simulate~~ a permanent failure within the electric control transmission of the trailer braking system ~~which~~ precludes the service braking system performance being met, simulate such a failure and check that byte 2, bits 3 - 4 of EBS 22 transmitted by the trailer is set to 01b. A signal should also be transmitted via pin 5 of the ISO 7638 connector (yellow warning).

4.2.2.2.1.2. Reduce the voltage on pins 1 and 2 of the ISO 7638 connector to below a value nominated by the manufacturer which precludes the service braking system performance from being fulfilled and check that byte 2, bits 3 - 4 of EBS 22 transmitted by the trailer are set to 01b. A signal should also be transmitted via pin 5 of the ISO 7638 connector (yellow warning).

4.2.2.2.1.3. Increase the voltage on pins 1 and 2 of the ISO 7638 connector to above a value nominated by the manufacturer which precludes the service braking system performance from being fulfilled and check that byte 2, bits 3 - 4 of EBS 22 transmitted by the trailer are set to 01b. A signal should also be transmitted via pin 5 of the ISO 7638 connector (yellow warning).

4.2.2.2.1.~~34~~. Check compliance with the provisions of paragraph 5.2.2.16. of this Regulation by isolating the supply line. Reduce the pressure in the trailer pressure storage system to the value nominated by the manufacturer. Check that byte 2, bits 3 - 4 of EBS 22 transmitted by the trailer is set to 01b and that byte 1, bits 7 - 8 of EBS 23 is set to 00. A signal should also be transmitted via pin 5 of the ISO 7638 connector (yellow warning).

4.2.2.2.1.~~45~~. When the electrical part of the braking equipment is first energised check that byte 2, bits 3 - 4 of EBS 22 transmitted by the trailer is set to 01b. After the braking system has checked that no defects that require identification by the red warning signal are present the above message should be set to 00b.

4.2.2.3. Response time checking

4.2.2.3.1. Check that, with no faults present, the braking system response time requirements defined in paragraph 3.5.2. of annex 6 to this Regulation are met.

4.2.3. Additional checks

4.2.3.1. At the discretion of the Technical Service the checking procedures defined above may be repeated with the non-braking messages relevant to the interface in different states or switched off.

Where repeat measurements of the brake system response time are carried out, variations in the value recorded may occur due to the reaction of the vehicle pneumatics. In all cases the prescribed response time requirements shall be met.

Justification:

The standard ISO 11992 which specifies the electric control line between towing and towed vehicles was revised in the last two years by the responsible ISO experts. The new versions are as follows:

Road vehicles —

Interchange of digital information on electrical connections between towing and towed vehicles —

Part 1: Physical layer and data link layer

Part 2: Application layer for braking and running gear equipment

Part 3: Application layer for equipment other than braking and running gear

The following modifications have been made:

- The standard now distinguishes exactly between "braking and running gear applications" and "other applications". This is in accordance with ECE R13 which expressly permits only braking and running gear data to be transmitted via the electric control line (paragraph 5.1.3.6.)
- Part 1 contained an unnecessary requirement for the fault handling in case of a short circuit between the data communication cables. This was corrected.
- Supplement 5 to the 09 series of amendments to Regulation No. 13 required the addition of a new parameter "Supply line braking request". This parameter was added to part 2.
- Moreover new parameters for the support of vehicle stability control systems were added.
- The documents were also revised editorially in some places to improve readability and clearness.

From the technical point of view the new versions of ISO 11992 are only an extension of those currently referenced in ECE R13. New developments based on the new documents will be compatible with today's solutions.

The new versions of ISO 11992 will be published as Draft International Standards in 2001. Thus the references in ECE R13 can be updated - with the following advantages:

- ECE R13 and ISO 11992 are consistent documents.
- Annex 16 of ECE R13 can be deleted.
- New safety control systems for vehicle stability are supported.

Some issues in detail:

- The references to ISO 11992-3 can be deleted because all data related to braking and running gear (and therefore to be transmitted via the electric control line) are combined now in part 2.
- For the same reason Annex 16 of ECE R13 can be deleted. Since ISO 11992 now clearly distinguishes between "braking and running gear" and other data, interpretation of ISO 11992 for the purposes of ECE R13 (those parameters are permitted and those that are not) is no longer necessary.
- The introduction of the new parameter "Supply line braking request" lead to new test steps in Annex 17 to prove the correct implementation.
- Paragraphs 3.2.2.3.1 and 3.2.2.3.2 of Annex 17 currently reference paragraph 5.2.1.29.2 of ECE R13. This paragraph specifies the yellow trailer warning signal. Obviously the failure simulations described in Paragraphs 3.2.2.3.1 and 3.2.2.3.2 should lead to the display of the yellow warning lamp foreseen to indicate failures within the braking system of the power-driven vehicle (compare paragraph 5.1.3.6.2.).
- The current wording of Paragraph 4.2.2.2.1.2. of Annex 17 assumed that a least one permanent failure within the electric control transmission of the trailer braking system is possible which precludes the service braking system performance. This must not be the case, for example in case of a pneumatic backup circuit. The proposed modification takes this into account.
- A new test step to check the system behaviour in case of overvoltage was added (Paragraph 4.2.2.2.1.3.)