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| Transmitted by the experts of the Task Force Tyre Pressure Monitoring System & Tyre Installation (TPMSTI) | Informal document **GRBP-73-03**  (73rd GRBP, 26-29 January 2021,  agenda item 5 (f)) |

**Proposal for amendments to the 01 series of amendments to**

**UN Regulation No. 141 (Tyre pressure monitoring system)**

The changes compared to document ECE/TRANS/WP.29/2021/10 are marked in **bold** for added text and strike through for deleted text, all in red font.

**I. Proposal:**

*Paragraph 5.1.2.,* amend to read:

“5.1.2. The effectiveness of the tyre pressure monitoring system**, the tyre pressure refill system or the central tyre inflation system** fitted on a vehicle …..”

*Paragraph 5.2.3.,* amend to read:

“5.2.3. For vehicles of category M2, M3, N2~~,~~ **and** N3~~, O~~~~3~~ ~~and O~~4, fitted with tyres of the tyre class C2 or C3, the TPMS shall illuminate the warning signal described in paragraph 5.5. within not more than ten minutes of cumulative driving time after the in service operating pressure in one of the vehicle's **rolling** tyres **in contact with the ground** has been reduced by 20 per cent.”

*Insert a new paragraph 5.2.4,* to read:

**“5.2.4. For vehicles of category O3 and O4 , fitted with tyres of the tyre class C2 or C3, the TPMS shall illuminate the warning signal described in paragraph 5.5. within not more than ten minutes of cumulative driving time after the in service operating pressure in one of the vehicle's rolling tyres in contact with the ground has been reduced by 20 per cent.”**

*Renumber the former paragraph 5.2.4.,* amend to read:

“5.2.~~4.~~**5.** The low tyre pressure warning signal described in paragraph 5.5. shall be illuminated whenever the towed vehicle TPMS provides low tyre pressure warning information via the communication interface described in paragraph 5.6.”

*Paragraph 5.3.2.,* amend to read:

“5.3.2. For vehicle**s** ~~category~~ of category M1 up to a maximum mass of 3,500kg and N1, fitted with tyres of the tyre class C2, the TPMS shall illuminate the warning signal described in 5.5. within not more than 60 minutes of cumulative driving time after the in service operating pressure in any of the vehicle's tyres has been reduced by 20 per cent or it is at a minimum pressure of 220 kPa, whichever is higher.”

*Paragraph 5.3.3.,* amend to read:

“5.3.3. For vehicle**s** **of category** ~~categories~~ M2, M3, N2 and N3, fitted with tyres of the tyre class C2 or C3, the TPMS shall illuminate the warning signal within not more than 60 minutes of cumulative driving time after the in-service operating pressure in any of the vehicle's rolling tyres in contact with the ground has been reduced by 20 per cent.“

*Paragraph 5.3.4.,* amend to read:

“5.3.4. For vehicle**s** of **category** ~~categories~~ O3 and O4, fitted with tyres of the tyre class C2 or C3, the TPMS shall transmit an appropriate warning signal described in 5.5 within not more than 60 minutes of cumulative driving time after the in-service operating pressure in any of the vehicle's rolling tyres in contact with the ground has been reduced by 20 per cent.”

*Annex 3 paragraph 2.4.1.,* amend to read:

“2.4.1. …………..

For vehicles of category M2, M3, N2, N3, O3 and O4, drive the vehicle for a minimum of 120 minutes within the speed range in paragraph 1.5.2. to this ~~annex~~ **Annex**, and with an average speed of ~~57~~ **60** km/h (10 km/h). It is allowed to be outside the speed range for a maximum cumulative time of two minutes during this phase.”

*Annex 3 paragraph 2.6.2.1.,* amend to read:

“2.6.2.1. Drive the vehicle along any portion of the test course. After not less than twenty (20) minutes and not more than forty (40) minutes bring the vehicle to a complete standstill with the engine switched off and the ignition key removed for not less than one (1) minute or more than three (3) minutes. Resume the test. The sum of the total cumulative drive time shall be the lesser of sixty (60) minutes of cumulative driving under the conditions set out in paragraph ~~1.4.2~~ **1.5.2**. above or the time at which the low tyre pressure tell-tale illuminates.”

**Proposal for amendments to ECE/TRANS/WP.29/GRBP/2021/6**

The changes compared to document ECE/TRANS/WP.29/GRBP/2021/06 are marked in **bold** for added text and strike through for deleted text, all in red font.

**II. Proposal**

*Annex 5 Part A Paragraph 2.1.2.,* amend to read:

*“2.1.2.* Mandatory messages transmitted from the towed vehicle to the towing vehicle:

| *Function / Parameter* | *ISO 11992-2:2014 reference* | *Reference to paragraphs in this UN Regulation* |
| --- | --- | --- |
| Tyre Pressure Status | EBS23  Byte 1 Bit 1-2 | **Paragraph 5.2.4.**  Paragraph 5.3.5  **Paragraph 5.4.3.** |
| Tyre/wheel identification (pressure) | EBS23 Byte 2 | **Paragraph 5.2.4.**  Paragraph 5.3.5  **Paragraph 5.4.3.** |

*“*

*Annex 5 Part A Paragraph 2.2.,* amend to read:

“2.2. When the towed vehicle transmits the following messages, the towing vehicle shall provide a low tyre pressure warning to the driver:

| *Function / Parameter* | *ISO 11992-2:2014 reference* | *Driver warning required* |
| --- | --- | --- |
| Tyre Pressure Status  *(For Low Tyre Pressure Warning Indication)* | EBS23 Byte 1 Bit 1-2  (~~002~~ **002** — tyre pressure insufficient) | References to paragraph 5.2.3., 5.2.4., ~~5.3.3.~~ **5.3.4**., 5.3.5. and 5.5.2. in this UN Regulation |
| Tyre/wheel identification *(corresponding to Tyre Pressure Status)* | EBS23 Byte 2  (~~XXXXXXXX~~~~b~~ **XXXXXXXX2** — actual Tyre/Wheel ID)  OR  (~~00000000~~~~b~~ **000000002**  —  Tyre/Wheel ID not defined **or wheel not defined and axle > 1510**)  OR  (~~11111111~~~~b~~ **111111112** —  Tyre/Wheel ID not available **or wheel = 1510 and axle = 1510**) | References to paragraph 5.2.3., 5.2.4., ~~5.3.3.~~ **5.3.4**., 5.3.5. and 5.5.2. in this UN Regulation |

“

*Annex 5 Part A Paragraph 2.3.,* amend to read:

“2.3. When the towed vehicle transmits the following messages, the towing vehicle shall provide a TPMS malfunction indication to the driver:

| *Function / Parameter* | *ISO 11992-2:2014 reference* | *Driver warning required* |
| --- | --- | --- |
| Tyre Pressure Status  *(For TPMS Malfunction Indication)* | EBS23 Byte 1 Bit 1-2  (~~002~~ **102** — error indicator) | Reference to paragraph 5.4.1., 5.4.2. and 5.5.2. in this UN Regulation |
| Tyre/wheel identification *(corresponding to Tyre Pressure Status)* | EBS23 Byte 2  ~~XXXXXXXX~~~~b~~ **XXXXXXXX2** — actual Tyre/Wheel ID)  OR  (~~00000000~~~~b~~ **000000002**  —  Tyre/Wheel ID not defined **or wheel not defined and axle > 1510**)  OR  (~~11111111~~~~b~~ **111111112** —  Tyre/Wheel ID not available **or wheel = 1510 and axle = 1510**) | Reference to paragraph 5.4.1., 5.4.2. and 5.5.2. in this UN Regulation |

“

*Annex 5 Part A Paragraph 25.,* amend to read:

“2.5. When a valid Tyre Pressure Status is temporarily not available (i.e. unavailable for less than 10 minutes of cumulative drive time), the towed vehicle shall transmit the following messages:

| *Function / Parameter* | *ISO 11992-2:2014 reference* | *Driver warning required* |
| --- | --- | --- |
| Tyre Pressure Status  *(TPMS data temporarily unavailable)* | EBS23 Byte 1 Bit 1-2  (~~112~~ **112** — not available) | Not applicable |
| Tyre/wheel identification *(corresponding to Tyre Pressure Status)* | EBS23 Byte 2  ~~XXXXXXXX~~~~b~~ **XXXXXXXX2** — actual Tyre/Wheel ID)  OR  (~~00000000~~~~b~~ **000000002** —  Tyre/Wheel ID not defined **or wheel not defined and axle > 1510**)  OR  (~~11111111~~~~b~~ **111111112** —  Tyre/Wheel ID not available **or wheel = 1510 and axle = 1510**) | Not applicable |

“

*Annex 5 Part B Paragraph 2.,* amend to read:

“2. The towed vehicle gateway ECU that is part of the point-to-point link shall provide an interface with the ECU providing TPMS functionality complying with data link layer and physical layer in accordance with ISO ~~11898:2015~~ **11898-1:2015 and ISO 11898-2:2016**.”

*Annex 5 Part B Paragraph 2.1,* amend to read:

“2.1. The CAN bit-rate for the ISO ~~11898:2015~~ **11898-1:2015** interface shall be 250 kbit/s.”

*Annex 5 Part B Paragraph 2.2,* amend to read:

“2.2. The ISO ~~11898:2015~~ **11898-2:2016** bus termination shall be configured on the vehicle in accordance with the guidelines of the vehicle manufacturer for the given installation.”

*Annex 5 Part B Paragraph 3.,* amend to read:

“3. The parameters that are transmitted by the ISO ~~11898:2015~~ **11898-1:2015** communication interface shall be as defined within ISO 11992-2:2014 and shall be supported as follows:”

*Annex 6 Paragraph 2.2.1.1.1.,* amend to read:

“2.2.1.1.1. Simulate a towed vehicle low tyre pressure warning and check that the low tyre pressure warning signal specified in paragraph 5.5 of this regulation is displayed.

The parameters defined in EBS 23 bytes 1 and 2 of ISO 11992-2:2014 shall be transmitted as follows:

| *Control line signalling* | *EBS 23 Byte 1*  *Bits 1 - 2* | *EBS 23 Byte 2* |
| --- | --- | --- |
| Low Tyre Pressure Warning for tyre/wheel identification number 1,7 (Axle 1, left inner) | ~~00~~~~b~~ **002**  (tyre pressure insufficient) | ~~00010111~~~~b~~ **000101112**  (Tyre/Wheel “1,7”) |

“

*Annex 6 Paragraph 2.2.1.1.2.,* amend to read:

“2.2.1.1.2. Simulate a towed vehicle low tyre pressure warning (without known tyre/wheel ID) and check that the low tyre pressure warning signal specified in paragraphs 5.5 of this Regulation is displayed.

The parameters defined in EBS 23 bytes 1 and 2 of ISO 11992-2:2014 shall be transmitted as follows:

| *Control line signalling* | *EBS 23 Byte 1*  *Bits 1 - 2* | *EBS 23 Byte 2* |
| --- | --- | --- |
| Low Tyre Pressure Warning (without known tyre/wheel ID) | ~~00~~~~b~~  **002**  (tyre pressure insufficient) | ~~00000000~~~~b~~  **000000002**  (Tyre/Wheel ID not defined **or wheel not defined and axle > 1510)**  OR  ~~11111111~~~~b~~  **111111112**  (Tyre/Wheel ID not available **or wheel = 1510 and axle = 1510**) |

“

*Annex 6 Paragraph 2.2.1.2.1.,* amend to read:

“2.2.1.2.1. Simulate a towed vehicle TPMS malfunction, signalled by the towed vehicle TPMS, and check that the towed vehicle TPMS malfunction indication warning signal specified in paragraph 5.5.6. of this Regulation is displayed.

The parameters defined in EBS 23 bytes 1 and 2 of ISO 11992-2:2014 shall be transmitted as follows:

| *Control line signalling* | *EBS 23 Byte 1*  *Bits 1 - 2* | *EBS 23 Byte 2* |
| --- | --- | --- |
| TPMS Malfunction for tyre/wheel identification number 1,7 (Axle 1, left inner) | ~~10~~~~b~~  **102**  (Error indicator) | ~~00010111~~~~b~~  **000101112**  (Tyre/Wheel “1,7”) |

“

*Annex 6 Paragraph 2.2.1.2.2.,* amend to read:

“2.2.1.2.2. Simulate a towed vehicle TPMS malfunction (without known tyre/wheel ID) and check that the towed vehicle TPMS malfunction indication warning signal specified in paragraph 5.5.6. of this Regulation is displayed.

The parameters defined in EBS 23 bytes 1 and 2 of ISO 11992-2:2014 shall be transmitted as follows:

| *Control line signalling* | *EBS 23 Byte 1*  *Bits 1 - 2* | *EBS 23 Byte 2* |
| --- | --- | --- |
| TPMS Malfunction (without known tyre/wheel ID) | ~~10~~~~b~~  **102**  (Error indicator) | ~~00000000~~~~b~~  **000000002**  (Tyre/Wheel ID not defined **or wheel not defined and axle > 1510 )**  OR  ~~11111111~~~~b~~  **111111112**  (Tyre/Wheel ID not available **or wheel = 1510 and axle = 1510**) |

“

*Annex 6 Paragraph 3.2.2.2.,* amend to read:

“3.2.2.2. Follow the test procedure defined in Annex 3 of this Regulation and check that the TPMS warning and malfunction signals are transmitted as defined in paragraphs 2.2.~~,~~ **and** 2.3~~. and 2.4~~. of Part A of Annex 5 **to this Regulation**.”

**III. Justification General**

The Task Force TPMSTI agreed at its 9th meeting to continue working on the communication interface protocol of TPMS between towing and towed vehicles of categories N2, N3 and O3, O4, respectively. The suitable communication requirements, already described in Annex 5 on the basis of the ISO bus requirements, are revised in the same manner as described in UN Regulation No 13 and the relevant ISO documents.

In addition, certain other requirements were corrected in order to align them for TPMS, TPRS and CTIS or clarify the drafting.

**For section “I. Proposal”**

5.1.2: Alignment of requirements for TPMS, TPRS and CTIS.

5.2.3, new 5.2.4: Separate drafting for vehicles of category M2, M3, N2 and N3 in one paragraph and O3 and O4 in another paragraph for clearer drafting and for amending readily in the future, if necessary.

New 5.2.5, 5.3.2, 5.3.3, 5.3.4: drafting corrections for correct paragraph numbering and drafting alignment.

Annex 3:

* paragraph 2.4.1: new average speed, due to new boundary values of vehicle speed of the mentioned vehicle categories in the tests,
* paragraph 2.6.2.1: drafting correction.

**For section “II. Proposal”**

Annex 5:

* Part A: the messages, warnings or indications in the second column of the tables are corrected in accordance with the ISO 11992-2:2014 drafting. The third column of the tables is corrected, where applicable and necessary, with the full reference to the corresponding paragraphs in the main text of UN Regulation No 141 to the driver’s warnings.
* Part B: the ISO 11898 correct document references are introduced.

Annex 6:

The transmitted parameters in the second and third columns of the mentioned tables are corrected according with the ISO 11992-2:2014 drafting.

The paragraph 3.2.2.2 is amended with the correct reference to Annex 5 paragraphs.