E/ECE/324
E/ECE/TRANS/505 } Rev.2/Add.109/Amend.3

1 October 2004

AGREEMENT

CONCERNING THE ADOPTION OF UNIFORM TECHNICAL PRESCRIPTIONS FOR WHEELED VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED AND/OR BE USED ON WHEELED VEHICLES AND THE CONDITIONS FOR RECIPROCAL RECOGNITION OF APPROVALS GRANTED ON THE BASIS OF THESE PRESCRIPTIONS */

(Revision 2, including the amendments which entered into force on 16 October 1995)

Addendum 109: Regulation No. 110

Amendment 3

Supplement 3 to the original version of the Regulation - Date of entry into force: 12 August 2004

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF

1. SPECIFIC COMPONENTS OF MOTOR VEHICLES USING COMPRESSED NATURAL GAS (CNG) IN THEIR PROPULSION SYSTEM;
II. VEHICLES WITH REGARD TO THE INSTALLATION OF SPECIFIC COMPONENTS OF AN APPROVED TYPE FOR THE USE OF COMPRESSED NATURAL GAS (CNG) IN THEIR PROPULSION SYSTEM

UNITED NATIONS

*/ Former title of the Agreement:

Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958.

Annex 4B,

Paragraph 1.3.1., amend to read:

"1.3.1. Tensile strength and elongation for rubber material and for thermoplastic elastomers (TPE)"

Paragraph 1.3.1.3., amend to read:

"1.3.1.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 1.3.1.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Insert new paragraphs 1.3.2. to 1.3.2.3., to read:

"1.3.2. Tensile strength and elongation specific for thermoplastic material.

1.3.2.1. Tensile strength and elongation at break according to ISO 527-2 with the following conditions:

(i) specimen type: type 1 BA.
(ii) tensile speed: 20 mm/min.

The material has to be conditioned for at least 21 days at 23 °C and 50 per cent relative humidity prior to testing.

Requirements:

(i) tensile strength not less than 20 MPa.
(ii) elongation at break not less than 100 per cent.

1.3.2.2. Resistance to n-pentane according to ISO 1817 with the following conditions:

(i) medium: n-pentane.
(ii) temperature: 23 °C (tolerance according to ISO 1817).
(iii) immersion period: 72 hours.

Requirements:

(i) maximum change in volume 2 per cent.
(ii) maximum change in tensile strength 10 per cent.
(iii) maximum change in elongation at break 10 per cent.

After storage in air with a temperature of 40 °C for a period of 48 hours the mass compared to the original value may not decrease more than 5 per cent.

1.3.2.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 1.3.2.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Paragraph 1.4.1., amend to read:

"1.4.1. Tensile strength and elongation for rubber material and for thermoplastic elastomers (TPE)"

Paragraph 1.4.1.3., amend to read:

"1.4.1.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 1.4.1.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Insert new paragraphs 1.4.2. to 1.4.2.3., to read:

"1.4.2. Tensile strength and elongation specific for thermoplastic material.

1.4.2.1. Tensile strength and elongation at break according to ISO 527-2 with the following conditions:

(i) specimen type: type 1 BA.
(ii) tensile speed: 20 mm/min.

The material has to be conditioned for at least 21 days at 23 °C and 50 per cent relative humidity prior to testing.

Requirements:

(i) tensile strength not less than 20 MPa.
(ii) elongation at break not less than 100 per cent.

1.4.2.2. Resistance to n-hexane according to ISO 1817 with the following conditions:

(i) medium: n-hexane.
(ii) temperature: 23 °C (tolerance according to ISO 1817).
(iii) immersion period: 72 hours.

Requirements:

(i) maximum change in volume 2 per cent.
(ii) maximum change in tensile strength 10 per cent.
(iii) maximum change in elongation at break 10 per cent.

After storage in air with a temperature of 40 °C for a period of 48 hours the mass compared to the original value may not decrease more than 5 per cent.

1.4.2.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).

(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 1.4.2.1.

Requirements:

(i) maximum change in tensile strength 20 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 50 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Paragraphs 1.4.2. to 1.4.2.2. (former), should be renumbered as paragraphs 1.4.3. to 1.4.3.2.

Paragraph 1.5.3.1., amend to read:

"1.5.3.1. … the test-pressure as mentioned in paragraph 1.5.4.2. The test shall be performed on both new hose and after ageing according to ISO 188 as prescribed in paragraph 1.4.2.3. and subsequently to ISO 1817 as prescribed in paragraph 1.4.2.2."

Paragraph 2.3.1., amend to read:

"2.3.1. Tensile strength and elongation for rubber material and for thermoplastic elastomers (TPE)"

Paragraph 2.3.1.3., amend to read:

"2.3.1.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 2.3.1.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Insert new paragraphs 2.3.2. to 2.3.2.3., to read:

"2.3.2. Tensile strength and elongation specific for thermoplastic material.

2.3.2.1. Tensile strength and elongation at break according to ISO 527-2 with the following conditions:

(i) specimen type: type 1 BA.
(ii) tensile speed: 20 mm/min.

The material has to be conditioned for at least 21 days at 23 °C and 50 per cent relative humidity prior to testing.

Requirement:

(i) tensile strength not less than 20 MPa.
(ii) elongation at break not less than 100 per cent.

2.3.2.2. Resistance to n-pentane according to ISO 1817 with the following conditions:

(i) medium: n-pentane.
(ii) temperature: 23 °C (tolerance according to ISO 1817).
(iii) immersion period: 72 hours.

Requirements:

(i) maximum change in volume 2 per cent.
(ii) maximum change in tensile strength 10 per cent.
(iii) maximum change in elongation at break 10 per cent.

After storage in air with a temperature of 40 °C for a period of 48 hours the mass compared to the original value may not decrease more than 5 per cent.

2.3.2.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 2.3.2.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.

(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Paragraph 2.4.1., amend to read:

"2.4.1. Tensile strength and elongation for rubber material and for thermoplastic elastomers (TPE)"

Paragraph 2.4.1.3., amend to read:

"2.4.1.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C)
(ii) exposure period: 24 and 336 hours

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 2.4.1.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Insert new paragraphs 2.4.2. to 2.4.2.3., to read:

"2.4.2. Tensile strength and elongation specific for thermoplastic material.

2.4.2.1. Tensile strength and elongation at break according to ISO 527-2 with the following conditions:

(i) specimen type: type 1 BA.
(ii) tensile speed: 20 mm/min.

The material has to be conditioned for at least 21 days at 23 °C and 50 per cent relative humidity prior to testing.

Requirements:

(i) tensile strength not less than 20 MPa.
(ii) elongation at break not less than 100 per cent.

2.4.2.2. Resistance to n-hexane according to ISO 1817 with the following conditions:

(i) medium: n-hexane.
(ii) temperature: 23 °C (tolerance according to ISO 1817).
(iii) immersion period: 72 hours.

Requirements:

(i) maximum change in volume 2 per cent.
(ii) maximum change in tensile strength 10 per cent.
(iii) maximum change in elongation at break 10 per cent.

After storage in air with a temperature of 40 °C for a period of 48 hours the mass compared to the original value may not decrease more than 5 per cent.

2.4.2.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 2.4.2.1.

Requirements:

(i) maximum change in tensile strength 20 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 50 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Paragraphs 2.4.2. to 2.4.2.3. (former), should be renumbered as paragraphs 2.4.3. to 2.4.3.3.

Paragraph 2.5.3.1., amend to read:

"2.5.3.1. … the test-pressure as mentioned in paragraph 2.5.4.2. The test shall be performed on both new hose and after ageing according to ISO 188 as prescribed in paragraph 2.4.2.3. and subsequently to ISO 1817 as prescribed in paragraph 2.4.2.2."

Paragraph 3.3.1., amend to read:

"3.3.1. Tensile strength and elongation for rubber material and for thermoplastic elastomers (TPE)"

Paragraph 3.3.1.3., amend to read:

"3.3.1.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 ° C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 3.3.1.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Insert new paragraphs 3.3.2. to 3.3.2.3., to read:

"3.3.2. Tensile strength and elongation specific for thermoplastic material.

3.3.2.1. Tensile strength and elongation at break according to ISO 527-2 with the following conditions:

(i) specimen type: type 1 BA.
(ii) tensile speed: 20 mm/min.

The material has to be conditioned for at least 21 days at 23 °C and 50 per cent relative humidity prior to testing.

Requirement:

(i) tensile strength not less than 20 MPa.
(ii) elongation at break not less than 100 per cent.

3.3.2.2. Resistance to n-pentane according to ISO 1817 with the following conditions:

(i) medium: n-pentane.
(ii) temperature: 23 °C (tolerance according to ISO 1817).
(iii) immersion period: 72 hours.

Requirements:

(i) maximum change in volume 2 per cent.
(ii) maximum change in tensile strength 10 per cent.

(iii) maximum change in elongation at break 10 per cent.

After storage in air with a temperature of 40 °C for a period of 48 hours the mass compared to the original value may not decrease more than 5 per cent.

3.3.2.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 ° C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 3.3.2.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Paragraph 3.4.1., amend to read:

"3.4.1. Tensile strength and elongation for rubber material and for thermoplastic elastomers (TPE)"

Paragraph 3.4.1.3., amend to read:

"3.4.1.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 ° C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 3.4.1.1.

Requirements:

(i) maximum change in tensile strength 35 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.
(ii) maximum change in elongation at break 25 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Insert new paragraphs 3.4.2. to 3.4.2.3., to read:

"3.4.2. Tensile strength and elongation specific for thermoplastic material.

3.4.2.1. Tensile strength and elongation at break according to ISO 527-2 with the following conditions:

(i) specimen type: type 1 BA.
(ii) tensile speed: 20 mm/min.

The material has to be conditioned for at least 21 days at 23 °C and 50 per cent relative humidity prior to testing.

Requirements:

(i) tensile strength not less than 20 MPa.
(ii) elongation at break not less than 100 per cent.

3.4.2.2. Resistance to n-hexane according to ISO 1817 with the following conditions:

(i) medium: n-hexane.
(ii) temperature: 23 °C (tolerance according to ISO 1817).
(iii) immersion period: 72 hours.

Requirements:

(i) maximum change in volume 2 per cent.
(ii) maximum change in tensile strength 10 per cent.
(iii) maximum change in elongation at break 10 per cent.

After storage in air with a temperature of 40 °C for a period of 48 hours the mass compared to the original value may not decrease more than 5 per cent.

3.4.2.3. Resistance to ageing according to ISO 188 with the following conditions:

(i) temperature: 115 °C (test temperature = maximum operating temperature minus 10 °C).
(ii) exposure period: 24 and 336 hours.

After ageing the specimens have to be conditioned at 23 °C and 50 per cent relative humidity for at least 21 days prior to carrying out the tensile test according to paragraph 3.4.2.1.

Requirements:

(i) maximum change in tensile strength 20 per cent after 336 hours ageing compared to the tensile strength of the 24 hours aged material.

(ii) maximum change in elongation at break 50 per cent after 336 hours ageing compared to the elongation at break of the 24 hours aged material."

Paragraphs 3.4.2. to 3.4.2.3. (former), should be renumbered as paragraphs 3.4.3. to 3.4.3.3.

Paragraph 3.5.3.1., amend to read:

"3.5.3.1. … in an oven at a temperature of 120 °C ± 2 °C during 24 hours. The test shall be performed on both new hose and after ageing according to ISO 188 as prescribed in paragraph 3.4.2.3. and subsequently to ISO 1817 as prescribed in paragraph 3.4.2.2."

_____