Working Paper N° : TYREgtr-13-04
(OICA - Font for Tyre Identification Number in draft gtr)

Font for Tyre Identification Number

OICA proposal for amendment to the draft text of the gtr (only the bold text is changed):

1. PROPOSAL

I. STATEMENT OF TECHNICAL RATIONALE AND JUSTIFICATION

Paragraph 19, amend to read:

"19. In the case of required markings, it was possible to eliminate some markings that had become unnecessary over the years, such as the word Radial. Also, a significant change was made in the way the Tyre Identification Number (TIN) will be used in combination with other markings such as type approval numbers, but this will depend on the way individual Contracting Parties implement the gtr. **The requirements were also developed such that the TIN can be readable by both the human eye and "Optical Character Recognition" systems (OCR).**"

II. TEXT OF THE REGULATION

Add new paragraphs 3.2.1.9. to 3.2.1.10.2, to read:

"3.2.1.5. The Tyre Identification Number shall be located on ~~the intended outboard~~ **both** sidewall**s** of the tyre, and positioned between the bead and 50% of the distance from the bead to the tread. ~~On the other sidewall of the tyre either a tyre identification number or a partial tyre identification number is required. The partial tyre identification number is comprised of all characters except the date code~~.

3.2.1.6. The content of the manufacturer's code is optional, but the data field is not.

3.2.1.7. The symbols to be used in the tyre identification number format are A, B, C, D, E, F, H, J, K, L, M, N P, R, T, U, V, W, X, Y, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0.

3.2.1.8. The symbols that shall not be used are G, I, O, Q, S, and Z.

3.2.1.9. The Tyre Identification Number shall be:

3.2.1.9.1. of a character size not less than [6.35 mm (0.25 inch)] high, and

3.2.1.9.2. permanently moulded with a positive or negative relief of between [0.508 mm (0.020 inch) and 1.016 mm (0.040 inch)], measured from the surface surrounding the characters by less than [0.508 mm (0.020 inch)], into or onto the tyre.

3.2.1.10 The font of the partial Tyre Identification Number (as comprising all characters except the date code) shall be:

3.2.1.10.1. Futura Bold, Futura Modified Condensed or Futura Gothic, or

3.2.1.10.2. the font OCR-B as defined in ISO 1073-2:1976.

3.2.1.11. The font of the date code of the Tyre Identification Number shall be OCR-B as defined in ISO 1073-2:1976."

JUSTIFICATION

At the 12th meeting of the GRRF informal group on Tyre gtr, the tyre Industry questioned OICA about the proposal TYREgtr-12-03.

The questions and answers can be found below:

1. General:
   As stated in the Justification of document TYREgtr-12-03, the font and size of the TIN need to be accurately defined to ensure readability. The challenge of reading black type on black background is part of the reason for the OICA suggestion.

2. *Question: Does the 'optical character recognition' require a specific letter or number spacing? Does it comply with current FMVSS letter spacing requirements?*
   Answer: Specific letter or number spacing is not specified in either ISO 1073-2 or 49 CFR Part 574.

3. *Question: As you can see in the example below, both engraving and stamping are being used. Are these acceptable for OCR reader?*
   Answer: Yes, by analyzing the structure of the surface.

4. *Question: We also use plaquettes for most of the marking, which induces a line above and between the letter/number information. Would these lines confuse an OCR reader?*
   Answer: No, this is part of the recognition programming.

5. *Question: Will a prefix and suffix "symbol" confuse an OCR reader? For example, it is possible to place "DOT" in front of the TIN, and as a suffix, the Canadian Maple Leaf.*
   Answer: No, this is part of the recognition programming. A fixed or known suffix is good and could be used to make it easier to find the TIN.

6. Comment: The suggested fonts in paragraph 3.2.10.1. are versions of the Futura font. The new proposed wording clarifies this.

This new proposal modifies TYREgtr-12-03 in accordance with the remarks above.

In addition, at the 72nd session of GRRF, NHTSA voiced that the fundamental criteria for the marking font is that it must be readable by the human eye.
In this respect, and as it is impossible to legally assess whether "a font is readable by the human eye", OICA proposes that a dedicated sentence be added in the relevant paragraph of the "statement of technical rationale and justification" part of the gtr. In addition, it is required that the full TIN is present on both sidewalls of the tyre in order to always permit reading from the outside of the wheel or vehicle. In particular the date code of the TIN must be of a defined and stable font as it is the marking which is regularly changing hence presenting a reading challenge for OCR systems.

Background of the proposal

The Tyre Identification Number font and size need to be accurately defined to ensure readability by both the human eye and the "Optical Character Recognition" systems.
Some vehicle manufacturers use this marking, based on the NHTSA rule 49 CFR Part 574.10, to ensure that the right tyres are mounted on the right vehicles and to keep track of the tyres mounted on each vehicle, while labelling systems are proven unreliable and expensive.
Automated optical character recognition of the complete Tyre Identification Number is an efficient way to minimize misreadings and to simplify the recording of Tyre Identification Numbers.
Paragraph 3.2.1.8. of the Tyre GTR already partially addresses the problem of automated optical character recognition by prohibiting some characters which do not sufficiently differentiate from each other. However, to allow the automated optical character recognition to work on a black rubber surface in an industrial environment there need to be more limitations to the shape of the characters allowed.
The proposed font, OCR-B, is developed to ensure reliable readings by automated optical character recognition as well as by the human eye. The use of this font is widely spread in many other implementations.
The proposed sizes are indicated between [ ] as OICA has no position on the sizes nor on their accuracy.