Transmitted by the experts from CLEPA

Informal document **GRRF-80-12**
80th GRRF, 15-18 September 2015,
Agenda item 6

Proposal for amendments to Regulations No. 90

I. Proposal

5.3.3. Equivalent replacement discs or drums

5.3.3.1. Geometric requirements

The brake discs or drums shall be identical to the original brake disc or drum in respect to all dimensions, geometric features and basic design.

~~5.3.3.1.1. For discs the following maximum values shall be met:~~

	~~M_1, N_1, O_1, O_2~~	~~$M_2, M_3, N_2, N_3, O_3, O_4$~~
~~Thickness variation~~	~~0.015 mm~~	~~0.030 mm~~
~~Cheek thickness variation (for ventilated disc only)~~	~~1.5 mm~~	~~2.0 mm~~
~~Lateral run-out friction surface~~	~~0.050 mm*~~	~~0.15 mm*~~
~~Location bore variation~~	~~H9~~	~~H9~~
~~"Top hat" parallelism~~	~~0.100 mm~~	~~0.100 mm~~
~~Location face flatness~~	~~0.050 mm~~	~~0.050 mm~~
~~Friction surface roughness**~~	~~3.2 µm~~	~~3.2 µm~~

~~* n / a in the case of a floating disc~~
~~** Ra-value according to ISO 1302:2002~~

~~5.3.3.1.2. For drums the following maximum values shall be met:~~

	~~M_1, N_1, O_1, O_2~~	~~$M_2, M_3, N_2, N_3, O_3, O_4$~~
~~Radial run-out friction surface~~	~~0.050 mm~~	~~0.100 mm~~
~~Location bore variation~~	~~H9~~	~~H9~~
~~Ovality~~	~~0.040 mm~~	~~0.150 mm~~
~~Location face flatness~~	~~0.050 mm~~	~~0.050 mm~~
~~Friction surface roughness*~~	~~3.5 µm~~	~~3.5 µm~~

~~* Ra-value according to ISO 1302:2002~~

5.3.4. Interchangeable replacement discs or drums

5.3.4.1. Geometric requirements

As paragraphs ~~5.3.3.1.1.~~5.3.4.1.1 and ~~5.3.3.1.2.~~ 5.3.4.1.2 plus the same interface dimensions.

An interchangeable replacement disc or drum may differ from the original part disc in design features such as:

(a) Type and geometry of ventilation (for vented discs);

(b) Integral or composite disc or drum;

(c) Surface finish (e.g. holes, slots etc.).

~~5.3.3.1.1.~~ 5.3.4.1.1 For discs the following maximum values shall be met:

	M_1, N_1, O_1, O_2	M_2, M_3, N_2, N_3, O_3, O_4
Thickness variation	0.015 mm	~~0.030 mm~~ 0.050mm
Cheek thickness variation (for ventilated disc only)	1.5 mm	2.0 mm
Lateral run-out friction surface	0.050 mm*	0.15 mm*
Location bore variation	H9	H9
"Top hat" parallelism	0.100 mm	0.100 mm
Location face flatness	0.050 mm	0.050 mm
Friction surface roughness**	3.2 µm	3.2 µm

* n / a in the case of a floating disc
** Ra-value according to ISO 1302:2002

~~5.3.3.1.2.~~ 5.3.4.1.2 For drums the following maximum values shall be met:

	M_1, N_1, O_1, O_2	M_2, M_3, N_2, N_3, O_3, O_4
Radial run-out friction surface	0.050 mm	0.100 mm
Location bore variation	H9	H9
Ovality	0.040 mm	0.150 mm
Location face flatness	0.050 mm	0.050 mm
Friction surface roughness*	3.5 µm	3.5 µm

* Ra-value according to ISO 1302:2002

II. Justification

By definition (2.3.3.4) Equivalent brake discs & drums are identical to the original in all dimensional and geometric respects hence tables 5.3.3.1.1 & 5.3.3.1.2 which contain *general* values cannot comply with the prescribed requirement of being *identical* to the values of the original part since their values will differ from original part to original part. Consequently the requirement for compliance to these general tables has been removed for this category of brake disc & drum. It still applies to Interchangeable brake discs and drums and hence the tables have been moved and renumbered

Currently the majority of replacement brake discs for vehicles of category M2 / N2 / M3 / N3 / O3 / O4 are produced with a maximum permitted disc thickness variation of ~ 0.080mm. Many millions of brake discs have been produced at this level and entered service without issue.

The current requirement for a maximum permitted thickness variation of 0.030mm for vehicles of category M2 / N2 / M3 / N3 / O3 / O4 is thus far more demanding than is generally applied by the replacement brake disc manufacturers and the 0.050mm required by brake system manufacturers for the OE parts they produce.

It is therefore not surprising that 0.030mm is proving very difficult for producing companies to maintain consistently in economic volume production. It is therefore proposed to bring the value in line with the common OE specification of 0.050 mm