

**PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 124**

(Uniform provisions concerning the approval of wheels for passenger cars and their trailers)

Note: The text reproduced below has been prepared by the experts from Germany in order to extend the range of application, to make the application easier for wheel manufacturer of light alloy wheels and to avoid misunderstandings at the required wheel tests. It is based on document E/ECE/TRANS/505/ Rev.2/Add.123. The modifications to the existing text of the Regulation as well as inserted text are marked in **bold** characters.

A. PROPOSAL

Amend paragraph 1., to read:

1. SCOPE

This Regulation covers new replacement wheels designed for vehicles of categories M<sub>1</sub>, M<sub>1</sub>G, N<sub>1</sub>, O<sub>1</sub> and O<sub>2</sub> <sup>(1)</sup>.

Amend footnote <sup>(1)</sup>, to read:

<sup>(1)</sup> Categories M, N, and O as defined in Annex 7 to the Consolidated Resolution on the Construction of Vehicles (R.E.3) (document TRANS/WP.29/78/Rev.1/Amend.2).

Insert new paragraph 2.1.5., to read:

2.1.5. **"PCD"**, pitch circle diameter of bolt holes

Insert new paragraph 2.2.8., to read:

2.2.8. **"Styling"**, the wheel's exterior appearance

Insert new paragraph 2.12., to read:

2.12. **"Wheel family"**, in case of light alloy wheels of the same type, however, with different inset values, PCD and centre bore.

Amend paragraph 3.1.2.9., to read:

3.1.2.9. ....max. load capacity **at rolling circumference**

Amend paragraph 5.1.5., to read:

5.1.5. ....**part number of the wheel / rim, wheel type (optional)**

Insert new paragraph 6.5.2.1., to read:

6.5.2.1. One piece Wheels

- (e) **Alternating torque test according to Annex 9 of this Regulation (however, only if the technical service considers it necessary due to the number and thickness of spokes)**

Amend paragraph 6.5.2.2., to read:

6.5.2.2. Demountable rim wheels

- (e) **Alternating torque test according to Annex 9 of this Regulation (however, only if the technical service considers it necessary due to the construction design and number of fixings)**

Insert new paragraph 6.5.3.1., to read:

6.5.3.1. One piece wheels

- (e) **Alternating torque test according to Annex 9 of this Regulation (however, only if the technical service considers it necessary due to the number and thickness of spokes)**

Amend paragraph 6.5.3.2., to read:

6.5.2.2. Demountable rim wheels

- (e) **Alternating torque test according to Annex 9 of this Regulation (however, only if the technical service considers it necessary due to the construction design and number of fixings)**

Amend paragraph 6.6., to read:

6.6. Where a wheel manufacturer submits an application for type approval **for a wheel family, it is not necessary to carry out tests for each wheel version.** Worst case selection ...

ANNEX 1:

Amend paragraph 2.7., to read:

2.7. ....**max. wheel load and respective theoretical rolling circumference**

ANNEX 2:

Insert after the last sentence of this ANNEX 2, to read:

**The marking shall be at a position selected by the manufacturer. It shall be easy visible and clearly legible after the tyre has been mounted to the wheel and the wheel is fitted to the car.**

ANNEX 3:

Amend the last sentence of this ANNEX 3, to read:

**The marking must be at a position selected by the manufacturer. It must be visible and clearly legible after the tyre has been mounted to the wheel.**

ANNEX 4:

Amend (c) and (e), to read:

- (c) Check of the material characteristics ( $R_{p0,2}$ ,  $R_m$  and A) of **specimen taken from critical zones (such as the spoke, for example) as well as the inner and the outer rim flange. The take-off points and position of the samples must be depicted in the drawing.**
- (e) Analysis of metallurgic defects and **structure taken from the transition zone of the wheel disc and rim or from the fracture zone, if applicable.**

ANNEX 5:

Amend 1.1., to read:

- 1.1. A surface treated sample, taken from the production, shall be damaged by cross engraving (DIN EN ISO 2409) and stone impact (DIN EN ISO 20567-1) to represent .....

ANNEX 6:

Amend paragraph 4., to read:

4. **Test schedule for wheel families**

**Wheels of a wheel type with the same number of wheel attachment holes, same styling, different PCD and/or different inset values can be grouped at the same or at a lower value of test bending moment taking into account the test schedule to follow. Wheels with the largest centre hole diameter shall be included in the test. A negative test can be compensated by two positive tests. A retest with another negative test result necessitates the request for modified test samples.**

ANNEX 8:

Amend paragraph 1., to read:

- 1. **The fracture behaviour of the wheel striking an object at the outer rim flange must be checked at critical positions. For proof of adequate fracture behaviour, an impact test according to ISO 7141 (2005-07-04) shall be carried out.**

Amend paragraph 4., to read:

**4. Tests schedule for wheel families**

Wheels to be tested	Impact test
smallest pitch circle diameter largest pitch circle diameter	one for each impact position one for each impact position
deviation of inset value up to -15 mm <b>more than -15 mm and larger than +2 mm</b>	--  one for each impact position

Insert paragraph 5., to read:

**5. Failure criteria**

**The wheel will not pass the test if one of the following criteria applies:**

- (a) visible incipient crack in a zone of the wheel disc of wheel assembly,**
- (b) the centre member separates from the rim**
- (c) total loss of pressure within one minute**

**The wheel is not considered to have failed the test by deformation of the wheel assembly or by fractures in the area of a rim section struck by the face plate of the striker.**

Delete Annex 8 – Appendix 1

ANNEX 10

Amend paragraph 1.2., to read:

**1.2. Vehicle characteristics**

**Those vehicle characteristics should be listed that distinctly describe the vehicle type and version for which the wheel will be used. Thereby, depending on the restriction of the range of application of various markets with respect to certain vehicle versions and variants , various specification characteristics are possible.**

**Absolutely required is the data of**

- vehicle manufacturer**
- vehicle type**
- vehicle approval number**
- engine performance (also possible range of performance)**

**Other specification characteristics / restrictions may also be used**

Amend paragraph 1.5., to read:

1.5. Example of possible structures of the application and fitting information table

Wheel characteristics (mandatory fields in **bold** characters)

<b>Approval Number</b>				
<b>Wheel Type</b>				
<b>Size</b>	<b>Fixing holes / pcd (mm)</b>		<b>Inset (mm)</b>	<b>Max. wheel load (N)</b>
<b>6 Jx15 H2</b>				
Wheel marking (Variant/Version)	centering marking	<b>centering (mm)</b>	date of manufac- ture (week/year)	<b>at circumference (mm)</b>

Vehicles characteristics as well as additional conditions and advice

**Vehicle manufacturer:**

.....

Fitting parts

e.g. special bolts delivered by the wheel manufacturer  
M14x1.5, conical angle 60°, length of piston skirt  
xx mm

<b>Vehicle Type</b>		.....	
<b>EEC - Approval No.</b>		.....	
<b>Performance ( KW from – to)</b>	<b>Vehicle Model name</b>	<b>Permissible tyre size front and rear axle</b>	<b>Additional conditions and advice</b>
			<b>A01)A02)A03) E01)</b>

Conditions and Advice

A01) e.g. kind of balancing weights and their place of fitting

A02) e.g. kind of possible valves

A03) e.g. for using manufacturer's replacement wheels only the standard fitting parts are allowed

E01) e.g. not allowed on 4x4 vehicles

**B. JUSTIFICATION**

To 1: The range of application of the regulation will be extended to vehicles of Category N<sub>1</sub>, that as a rule are identical in construction with regard to (the technical equipment of) vehicles of Category M<sub>1</sub>.

To 2.1.5: The definition has been incorporated into the regulation without explanations; this will lead to different interpretations when translated into national languages. Therefore, a clear statement becomes necessary.

To 2.2.8: It makes sense to list only those wheels that do not vary optically under one approval number, inasmuch as in the following requirements of the regulation this is being done. Serves clarification purposes.

To 2.12: In Annex 6 the definition is being used for the possible pooling of tests. The definition serves the avoidance of errors during the establishment of families. Here, the definition of the wheel family is listed.

- To 3.1.2.9: The maximum allowable wheel load is to be viewed as function of the used tyre's tread circumference.
- To 5.1.5: For a single wheel version a statement concerning the type is being considered as sufficient. This usually is the case with identical and identical replacement wheels.
- To 6.5.2.1: Generally, an alternating torque test becomes necessary, if due to the low number or thickness of spokes the technical service questions the wheel strength at torque loads forced by acceleration and braking operations.
- To 6.5.2.2: Generally, an alternating torque test becomes necessary, if due to the low number or size of screws the technical service questions the wheel strength at torque loads forced by acceleration and braking operations.
- To 6.5.3.1: Generally, an alternating torque test becomes necessary, if due to the low number or thickness of spokes the technical service questions the wheel strength at torque loads forced by acceleration and braking operations.
- To 6.5.3.2: Generally, an alternating torque test becomes necessary, if due to the low number or size of screws the technical service questions the wheel strength at torque loads forced by acceleration and braking operations.
- To 6.6: This redrafting becomes necessary since prior to this a new type classification was established. The worst case selection is possible for wheel versions within a wheel family.

#### ANNEX 1

- To 2.7: A statement of the maximum allowable wheel load only makes sense in connection with the allowable tyre-tread circumference of the largest tyre equipment described in the range of application. This serves as calculation base for the bending moment determined during the impact test.

#### ANNEX 2

The approval number serves as a means of identification of the wheel mounted to the vehicle in traffic. For this reason, it must be legible without demounting the wheel.

#### ANNEX 3

The manufacturer defines the marking of the wheel (drawing). However, it must be carried out in such a manner that it is clearly legible and visible after the tyres have been mounted.

#### ANNEX 4

The sample taking should be performed in areas of the wheel that are extremely strained. The wheel flange is rather uncritical due to the large thickness of material. At the intersection area of spoke and rim samples of the required dimensions can only be taken from certain design species. In the case of light alloy wheels, spokes and rim flange are considered

a good sample taking area. The sample taking locations should be listed so as to be able to use the results – e.g. within the scope of a COP. The same applies to micrographs.

## ANNEX 5

Correction of standards listed for cross engraving and stone impact.

## ANNEX 6

To 4: A decisive factor for the worst case selection procedure is that the wheels belong to one wheel family, i.e. stem from one mould. This is being explained here once again. However, the table displayed here contains among different inset values also the possibility to test wheels with different pitch circles with a simplified procedure, which does make sense for wheel families.

## ANNEX 8

To 1: The impact test is performed according to the international standard ISO 7141 (Datum) and thus, is laid down in writing. – Therefore, additional explanations regarding the procedure can be omitted.

To 4: The table contained some errors which were corrected: With different inset values an enlargement of the inset value is being considered as critical since the flange will become thinner. Insofar, another sample must be tested.

To 5: Since the appendix to Annex 8 has been deleted, the failure criteria are being listed here, again.

## ANNEX 10

To 1.2: Decisive for a safe identification of vehicles that are appropriate for the wheels are those characteristics that are known to the individual vehicle keeper or ones that he can get to know – either by means of documents or from data on the vehicle itself. These characteristics can vary depending on existing stipulations of the individual markets (countries). Within the scope of the approval procedure, the vehicle manufacturer describes the variants and versions being part of the vehicle licensure. However, the VIN does not always contain the data required to enable a safe identification of a certain vehicle variant / version.

Aside from this, not all vehicle manufacturers provide a key to the deciphering of the WMI, VDS and year of construction that are contained in the VIN.

As a rule, a safe means is the identification by the vehicle manufacturer, the approval number that was allocated to the vehicle in its particular market area, the vehicle type as well as engine performance.

Additionally, however, further characteristics can be required: e.g. data on the attachment (attachment bores and pitch circle) of series wheels.

The presentation, as the attached sample proves, has been considered as expedient within the European Union, since a distinct identification is possible. Other markets, however, can require different characteristics, which will have to be agreed upon in individual cases by the respective approval authorities.