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Consideration and vote by AC.3 of draft global technical regulation and/or draft amendments to established global technical regulations

Proposal for Amendment 2 to global technical regulation No. 2 (World-wide Motorcycle emission Test Cycle (WMTC))

Submitted by the Working Party on Pollution and Energy*

The text reproduced below was adopted by the Working Party on Pollution and Energy (GRPE) at its sixty-first session to introduce performance requirements into the existing global technical regulation No. 2 and to clarify the current text. It is based on document ECE/TRANS/WP.29/GRPE/2011/4, not amended (ECE/TRANS/WP.29/GRPE/61, para. 15). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Executive Committee (AC.3) for consideration.

* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208/, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

Part A (Statement of technical rationale and justification)

Paragraph 2, amend to read:

"**2. Procedural Background**

The work on the gtr started in May 2000 …… was also approved as a gtr project by AC.3.

The gtr No. 2 was approved by AC.3 in June 2005. Amendment 1 to gtr No. 2 was approved by AC.3 in November 2007.

The draft text of Amendment 2 to gtr No. 2 on the introduction of performance requirements (limit values for pollutant emissions for vehicles fitted with gasoline engines) was approved by GRPE in January 2011, subject to final decisions concerning the format of the text by AC.3."

Paragraph 4, amend to read:

"**4. Discussion of Issues Addressed by the gtr**

...

In each of these steps, specific technical issues were raised, discussed, and resolved. The technical report describes this information. Additionally, other issues addressed in this gtr are identified below.

…

(d) Performance Requirements

The principal emission limit values (paragraph 5.2. of the text of the regulation) represent the most stringent limits currently applied in national or regional legislation with the test procedures set out in this gtr. Vehicles complying with the principal emission limits contained in paragraph 5.2. are therefore deemed to comply with the alternative requirements contained in paragraph 5.3.

Paragraph 5.3. contains alternative emission limits of stringency proposed by the Contracting Parties, as foreseen by articles 4.2 and 7.2 of the 1998 Agreement.

There can be several reasons for the introduction of alternative emission limits:

(i) Different environmental priorities for different gaseous pollutants, CO_2 and energy/fuel conservation, or cost-benefit situation;

(ii) Diverse traffic situation or special vehicles (performance, classification);

(iii) Separated or combined limits for HC and NO_x;

(iv) Different reference fuels because of the market fuel situation.

Contracting Parties may opt to accept motorcycles complying with one or more of these alternative performance requirements (paragraph 5.3.)

in addition to the motorcycles complying with principal requirements (paragraph 5.2.).

When a Contracting Party transposes this global technical regulation in a manner that includes any of the specified alternative performance requirements, the national or regional legislation should ensure that a motorcycle that complies with the principal performance requirements in this gtr will satisfy the national or regional legislation. This will give some planning reliability for manufacturers. Compliance with the principal or alternative performance requirements, as opted for by the Contracting Party, will be determined by the national or regional certification or type approval authority.

It is the intent that gtr would be amended to update the principal emission limits at such time when new more stringent limits are adopted through national or regional legislation. It may also become necessary to amend the alternative emission limits due to such developments in countries opting for alternatives.

It is also expected that different Contracting Parties will start applying principal emission limits at different dates considering the lead time required for implementing stricter norms. It may also become necessary to induct the earlier principal emission limit as one of the alternatives.

(e) Reference Fuel

The principal performance requirements introduced in paragraph 5.2. of this gtr are based on the use of the reference fuel as specified in Annex 2.1. of gtr No. 2. The use of this standardized reference fuel for determining compliance with the emission limits set out in paragraph 5.2. is considered as an ideal condition for ensuring the reproducibility of regulatory emission testing, and Contracting Parties are encouraged to use such fuel in their compliance testing.

Contracting Parties may use alternative reference fuels for the principal performance requirements in paragraph 5.2. on condition that their equivalence with the reference fuel in Annex 2.1 in terms of emissions is demonstrated.

The alternative performance requirements in paragraph 5.3. are applicable with the corresponding reference fuels.

(f) Durability requirements and/or useful life provisions are currently outside the scope of this gtr. Accordingly, Contracting Parties may specify durability requirements and/or useful life provisions in their national or regional legislation in relation to the emission limits set out in section 5 of this gtr."

Paragraph 5, amend to read:

"5. Regulatory Impact and Economic Effectiveness

...

(b) Potential cost effectiveness

Specific cost effectiveness values for this gtr have not been calculated. It is expected that each Contracting Party can develop such information with the transposition of this gtr into national or regional legislation. Specific cost effectiveness values can be quite different, depending on the national or regional environmental needs and market situation. While there are no calculated costs per ton values here, the belief of the informal group on WMTC is that there are clear benefits associated with Amendment 2 to gtr No. 2."

Part B (Text of the regulation)

Paragraph 5, amend to read:

"5. Performance requirements for vehicles fitted with gasoline engines

Insert new paragraphs 5.1. to 5.3.3., to read (*inserting also new footnotes* [1, 2]):

5.1. Optional performance requirements

The principal requirements of performance are set out in paragraph 5.2. Contracting Parties may also accept compliance with one or more of the alternative performance requirements set out in paragraph 5.3.

5.2. The principal performance requirements [1]

The gaseous emissions for each class of vehicle defined in paragraph 6.3., obtained when tested in accordance with the cycles specified in paragraph 6.5.4.1., shall not exceed the values specified in Table 5-1.

Table 5-1
Limit values for gaseous emissions CO, HC and NO_x

	CO		***HC***		***NO_x***	
Vehicle Class	***Class 1 and Class 2***	***Class 3***	***Class 1 and Class 2***	***Class 3***	***Class 1 and Class 2***	***Class 3***
Limit values L_A in mg/km	2200	2620	450	270	160	210

5.3. Alternative performance requirements [2]

5.3.1. Alternative performance requirements A

The gaseous emissions for each class of vehicle defined in paragraph 6.3., for the alternate performance requirements, obtained when tested in accordance with the cycles specified in paragraph 6.5.4.1., except that vehicles in Class

[1] The limit values set out in Table 5-1 represent the most stringent national or regional emission limits applied by a Contracting Party at the time of adoption of the last amendments to this gtr. It is the intent that the gtr would be amended to update these limit values at such time that new more stringent standards are adopted through national or regional legislation, in order to represent those new limit values.

[2] If necessary, at the request of a Contracting Party, further sub-paragraphs can be added to paragraph 5.3. in order to allow additional alternatives.

2.1 are to be tested by using the cycles prescribed for Class 1, shall not exceed the values specified in Table 5-2.

Table 5-2
Limit values for gaseous emissions CO, HC + NO_x

	CO		*HC + NO_x*		
Vehicle Class	***Class 1 and Class 2.1***	***Class 2.2 and Class 3***	***Class 1 and Class 2.1***	***Class 2.2***	***Class 3***
Limit values L_B in mg/km	1870	2620	1080	920	550

5.3.2. Alternative performance requirements B

The gaseous emissions for each class of vehicle defined in paragraph 6.3., obtained when tested in accordance with the cycles specified in paragraph 6.5.4.1., shall not exceed the values specified in Table 5-3.

Table 5-3
Limit values for gaseous emissions CO, HC, HC + NO_x

	CO	*HC*	*HC + NO_x*
Vehicle Class	***All***	***Class 1 and Class 2***	***Class 3***
Limit values L_B in mg/km	12000	1000	800

5.3.3. Alternative performance requirements C

The gaseous emissions for each class of vehicle defined in paragraph 6.3., obtained when tested in accordance with the cycles specified in paragraph 6.5.4.1., shall not exceed the values specified in Table 5-4.

Table 5-4
Limit values for gaseous emissions CO, HC and NO_x

	CO	*HC*		*NO_x*	
Vehicle Class	***All***	***Class 1 and Class 2***	***Class 3***	***Class 1 and Class 2***	***Class 3***
Limit values L_A in mg/km	2620	750	330	170	220

"

Paragraph 6.3.1., amend to read:

"6.3.1. Class 1

Vehicles that fulfil the following specifications belong to class 1:

50 cm³ < engine capacity < 150 cm³ and $v_{max} \leq 50$ km/h

or class 1

engine capacity < 150 cm³ and 50 km/h < v_{max} < 100 km/h"

Paragraph 6.4., amend to read:

"6.4. Reference fuel

Table 6-1 specifies the reference fuel specifications for the respective performance requirements in paragraph 5.

Table 6-1
Reference fuel specifications

Performance requirements	*Reference fuel specification*
Principal requirements in paragraph 5.2.	See Annex 2 (A.2.1)
Alternative A in paragraph 5.3.1.	See Annex 2 (A.2.1)
Alternative B in paragraph 5.3.2.	See United States Code of Federal Regulations, Title 40, Part 86, section 86.513-2004 "Fuel and engine lubricant specifications" (40 CFR 86.513-2004)
Alternative C in paragraph 5.3.3.	See Annex 2 (A.2.1)

"

Paragraph 6.5.7., amend to read:

"6.5.7. Measurement accuracies

Measurements have to be carried out using equipment that fulfil the accuracy requirements as described in table 6-2 below:

Table 6-2
Required accuracy of measurements

…"

Paragraph 8.1.1.5.1., amend to read:

"8.1.1.5.1. Test vehicles (motorcycles) with a positive ignition engine fuelled with petrol

$$FC = \frac{0.1155}{D} \times (0.866 \times HC + 0.429 \times CO + 0.273 \times CO_2) \quad \text{Equation 8-14}$$

Where:

…

D is the density of the test fuel in kg/litre at 15 **°C**. In the case of gaseous fuels this is the density at 20 °C."

Annex 2.1, amend to read (inserting a new footnote [7] to the table):

"**Annex 2.1**

Technical data of the reference fuel to be used for testing vehicles equipped with positive ignition engines (unleaded petrol properties) [7]

…

[7] The Japanese reference fuel specified in the *Road Vehicles Act, Safety Regulations for Road Vehicles, Announcement that Prescribes Details of Safety Regulations for Road Vehicles, Attachment 44* can be used by Contracting Parties as an alternative fuel for paragraph 6.4. for compliance with the principal emission limits in paragraph 5.2. Contracting Parties may also use other alternative reference fuels for the principal performance requirements in paragraph 5.2. under condition that their equivalence with the reference fuel in Annex 2.1 in terms of emissions is demonstrated."