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Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Pollution and Energy****Eighty-third session**

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Item 3(a) of the provisional agenda

Light vehicles: UN Regulations Nos. 68 (Measurement of the maximum speed, including electric vehicles), 83 (Emissions of M₁ and N₁ vehicles), 101 (CO₂ emissions/fuel consumption) 103 (Replacement pollution control devices) and 154 (Worldwide harmonized Light vehicles Test Procedures (WLTP))**Proposal for a new supplement to the 05, 06 and 07 series of amendments to UN Regulation No. 83 (Emissions of M₁ and N₁ vehicles)****Submitted by the expert from the International Organization of Motor Vehicle Manufacturers***

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA). This document aims at permitting the use of the latest reference fuels for evaporative emissions approval of vehicles in order to reduce the approval testing burden. The modifications to the current text of the Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2021 as outlined in proposed programme budget for 2021 (A/75/6 (Sect.20), para 20.51), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

In the 05 series of amendments, Annex 7, paragraph 3.2.1., amend to read:

“3.2.1. The appropriate reference fuel shall be used, as defined in Annex 10 to this Regulation.

As an alternative at the choice of the manufacturer, the appropriate reference fuel as defined in Annex 10 to the 06 or 07 series of amendments to this Regulation may be used.”

In the 06 series of amendments, Annex 7, paragraph 3.2.1., amend to read:

“3.2.1. The appropriate reference fuel shall be used, as defined in Annex 10 to this Regulation.

As an alternative at the choice of the manufacturer, in the case that E5 fuel has been used for the Type I test, E10 fuel may be used for the Type IV test.”

In the 06 and 07 series of amendments, Annex 4a, paragraph 5.1., amend to read:

“5.1. Test procedure

The procedure for measuring the vehicle road load is described in Appendix 7a to this annex.

As an alternative to this, the following measures may be used.

(a) **In the case where the vehicle road load has already been determined according to WLTP procedures as defined in UN GTR No. 15, the methodology, described in Appendix 7b may alternatively be used.**

(b) **In the case where a vehicle road load has already determined according to Appendix 7a to this annex, simulation of the other configurations of the vehicle which have same body shape or same transmission and type approval authority approves the simulation methodology proposed by the manufacture.**

~~This procedure is~~ **These procedures are** not required if the chassis dynamometer load is to be set according to the reference mass of the vehicle.”

II. Justification

1. The reference fuels used for EU5 or EU6 testing are a higher volatility and higher ethanol content than those described in the 05 series of amendments. This results in them demonstrating a worst case situation for evaporative emissions in comparison.

2. The 06 series of amendments permits free choice between E5 and E10 fuels. It is worth clarifying that if E5 is selected for the type I test, E10 may still be used as worst case for the Type IV test.

3. A comparison of the evolution of reference fuel specifications is attached as Table1 for information.

The road load shall be determined on the basis of physical measurement on a test track according to UN Regulation No. 83.

4. During the 80th session of GRPE, the alternative methodology converting WLTP road load to NEDC was adopted. In the case where NEDC road load has been already determined, the conversion from such data to the other version considered to be equivalent.

5. This concept is attached in Figure 1 for information.

Figure 1
Concepts for road load determinations

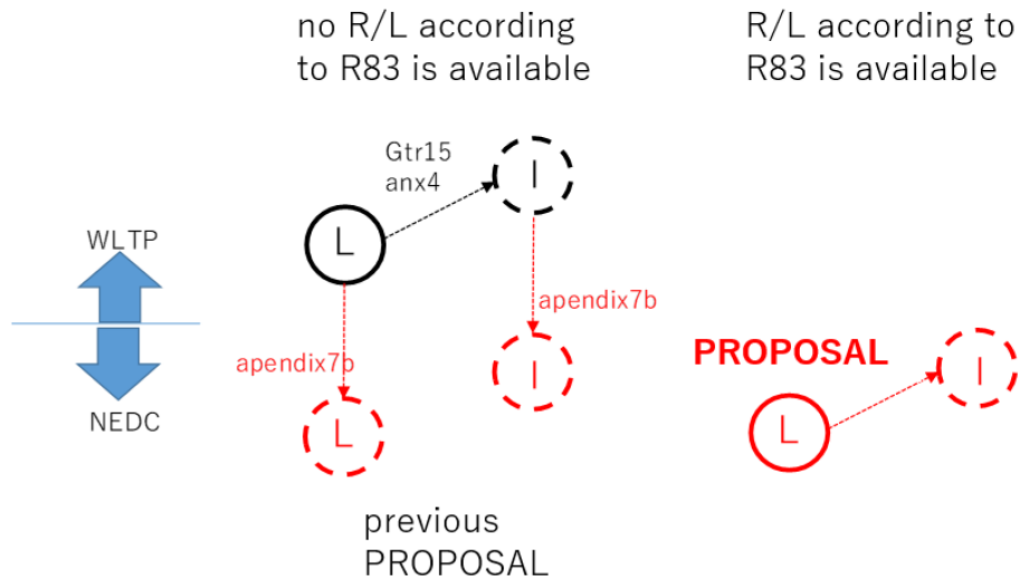


Table 1
Evolution of reference fuel specifications

Parameter	Unit	Minimum			Maximum			Comments
		UNR 83.05 (EU 3/4)	UNR 83.06/07 (EU5/6 E5)	UNR 83.06/07 (EU5/6 E10)	UNR 83.05 (EU 3/4)	UNR 83.06/07 (EU5/6 E5)	UNR 83.06/07 (EU5/6 E10)	
Research octane number, RON		95	95	95	-	-	98	E10 fuel in spec. by definition
Motor octane number, MON		85	85	85	-	-	89	E10 fuel in spec. by definition
Density at 15°C	kg/m ³	748	743	743	762	756	756	No change in calculation between 83.05 and 83.07
Reid vapour pressure	kPa	56	56	56	60	60	60	Specifications identical
Water content	% m/m					0.015	0.05	No effect on evap. emissions
Appearance @ -7°C				clear & bright			clear & bright	No effect on evap. emissions
Distillation:								
- initial boiling point	°C	24			40			E10 fuel worst case for evap.
- evaporated at 70°C			24	34		44	46	E10 fuel worst case for evap.
- evaporated at 100°C	per cent v/v	49	48	54	57	60	62	E10 fuel worst case for evap.
- evaporated at 150°C	per cent v/v	81	82	86	87	90	94	E10 fuel worst case for evap.
- final boiling point	°C	190	190	170	215	210	195	E10 fuel worst case for evap.
Residue	per cent v/v	-	-	-	2	2	2	Specifications identical
Hydrocarbon analysis:								
- olefins	per cent v/v	-	3	6	10	13	13	No effect on evap. emissions
- aromatics	per cent v/v	28	29	25	40	35	32	No effect on evap. emissions
- benzene	per cent v/v	-	-	-	1	1	1	Specifications identical
- saturates	per cent v/v	-	Report	Report	Balance	Report	Report	No effective difference
Carbon/hydrogen ratio		Report	Report	Report	Report	Report	Report	Specifications identical
Carbon/oxygen ratio			Report	Report		Report	Report	No effective difference
Induction period (2)	min.	480	480	480	-	-	-	Specifications identical
Oxygen content	per cent m/m	-	Report	3.3	2.3	Report	3.7	E10 fuel worst case for evap.
Existent gum	mg/100ml	-	-	-	4	4	4	Specifications identical
Sulphur content (3)	mg/kg	-	-	-	100	10	10	No effect on evap. emissions
copper corrosion		-	-	-	1	Class 1	Class 1	Specifications identical
Lead content	mg/l	-	-	-	5	5	5	Specifications identical
Phosphorus content	mg/l	-	-	-	1.3	1.3	1.3	Specifications identical
Ethanol	%v/v		4.7	9		5.3	10	E10 fuel worst case for evap.

Note: UNR 83.XX refers to the XX series of amendment to UN Regulation No. 83