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REVISED PROPOSAL FOR 02 SERIES OF AMENDMENTS TO REGULATION No. 96
(Diesel emissions of agricultural tractors)

Submitted by the expert from the European Association of
Internal Combustion Engine Manufacturers (EUROMOT)

Note: The text reproduced below was prepared by the expert from EUROMOT in order to align the provisions of the Regulation with those of the corresponding European Union Directive. The text is based on a document without a symbol (informal document No. GRPE-50-5), distributed during the fiftieth GRPE session (TRANS/WP.29/GRPE/50, para. 34). The modifications to the current text of the Regulations are marked in **bold** characters.

Revision 1 reflects the agreement reached at the fifty-first GRPE session to include constant speed engines into the scope of this Regulation (ECE/TRANS/WP.29/GRPE/51, paras. 29 and 30).

Note: This document is distributed to the Experts on Pollution and Energy only.

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A. PROPOSAL

Insert a new paragraph 1.3., to read:

"1.3. used in machinery intended and suited, to move, or to be moved on the ground, with or without road, having an installed net power higher than 18 kW, but not more than 560 kW, operated under constant speed, including but not limited to:

1.3.1. gas compressors;

1.3.2. irrigation pumps;

1.3.3. generating sets with intermittent load;

1.3.4. turf care, chippers, snow removal equipment, sweepers.

Paragraph 4.4.3., amend to read:

"4.4.3. an additional symbol consisting in a letter from D to **K** indicating the emission level (paragraph 5.2.1.) according to which the engine or engine family has been approved."

Paragraph 5.2.1., the table, amend to read (adding stage H to K emission limits):

"

Power Band	Net power (P) (kW)	Carbon monoxide (CO) (g/kWh)	Hydrocarbons (HC) (g/kWh)	Oxides of nitrogen (NO _x) (g/kWh)	Particulates (PT) (g/kWh)
E	130 ≤ P ≤ 560	3.5	1.0	6.0	0.2
F	75 ≤ P < 130	5.0	1.0	6.0	0.3
G	37 ≤ P < 75	5.0	1.3	7.0	0.4
D	18 ≤ P < 37	5.5	1.5	8.0	0.8
	Net power (P) (kW)	Carbon monoxide (CO) (g/kWh)	Sum of hydrocarbons and oxides of nitrogen (HC + NO_x) (g/kWh)		Particulates (PT) (g/kWh)
H	130 ≤ P ≤ 560	3.5	4.0		0.2
I	75 ≤ P < 130	5.0	4.0		0.3
J	37 ≤ P < 75	5.0	4.7		0.4
K	19 ≤ P < 37	5.5	7.5		0.6

"

Paragraphs 11.1. to 11.9., amend to read

- "11.1. As from the official date of entry into force of the **02** series of amendments, no Contracting Party applying this Regulation shall refuse to grant ECE approval under this Regulation as amended by the **02** series of amendments.
- 11.2. As from the date of entry into force of the **02** series of amendments, Contracting Parties applying this Regulation may refuse to grant ECE approvals to **intermittent speed** engines, or engines families, of the power band **H, I and K** which do not meet the requirements of this Regulation as amended by the **02** series of amendments.
- 11.3. As from **1 January 2007**, Contracting Parties applying this Regulation may refuse to grant ECE approvals to **intermittent speed** engines, or engines families, of the power band **J** which do not meet the requirements of this Regulation as amended by the **02** series of amendments.
- 11.4. **As from 1 January 2010, Contracting Parties applying this Regulation may refuse to grant ECE approvals to constant speed engines, or engine families, of the power bands H, I and K which do not meet the requirement of this Regulation as amended by the series 02 of amendments.**
- 11.5. **As from 1 January 2011, Contracting Parties applying this Regulation may refuse to grant ECE approvals to constant speed engines, or engine families, of the power band J which do not meet the requirements of this Regulation as amended by the series 02 of amendments.**
- 11.6. **As from the date of entry into force of the 02 series of amendments, Contracting Parties applying this Regulation may refuse the placing on the market of intermittent speed engines, or engine families, included in the power band H not approved under this Regulation as amended by the series 02 of amendments."**
- 11.7. **As from 1 January 2007, Contracting Parties applying this Regulation may refuse the placing on the market of intermittent speed engines, or engine families, included in the power bands I and K not approved under this Regulation as amended by the series 02 of amendments.**
- 11.8. **As from 1 January 2008, Contracting Parties applying this Regulation may refuse the placing on the market of intermittent speed engines, or engine families, included in the power band J not approved under this Regulation as amended by the series 02 of amendments.**
- 11.9. **As from 1 January 2011, Contracting Parties applying this Regulation may refuse the placing on the market of constant speed engines, or engine families, included in the power bands H, I and K not approved under this Regulation as amended by the series 02 of amendments."**

Insert a new paragraph 11.10., to read:

"11.10. As from 1 January 2012, Contracting Parties applying this Regulation may refuse the placing on the market of constant speed engines, or engine families, included in the power band J not approved under this Regulation as amended by the series 02 of amendments."

Paragraphs 11.10. and 11.11. (former), renumber as paragraphs 11.11. and 11.12., and amend to read:

"11.11. By derogation to the provisions stipulated on paragraphs **11.6., 11.7., 11.8., 11.9. and 11.10.**, Contracting Parties applying this Regulation may postpone each date mentioned in the above paragraphs for two years in respect of engines with a production date prior to the said dates.

11.12. By derogation to the provisions stipulated in paragraphs **11.6., 11.7., 11.8., 11.9. and 11.10.**, Contracting Parties applying this Regulation may continue to permit the placing on the market of engines approved on the basis of a previous technical standard, provided that the engines are intended as replacement for fitting in vehicles in use, and that it is not technically feasible for the engines in question to satisfy the new requirements of the **02** series of amendments."

Annex 4,

Paragraph 2.7., amend to read:

"2.7. The fuel shall be the reference fuel specified in annex 5 **for the respective power band:**

- **A.5.1. for power bands D to G**
- **A.5.2. for power bands H to K**

Optionally, the reference fuel specified in paragraph A.5.1. may be used for power bands H to K.

The cetane number ..."

Paragraph 3.6.1., amend to read:

"3.6.1. **For intermittent speed engines,** the following 8-mode cycle shall be followed in dynamometer operation on the test engine:"

Insert a new paragraph 3.6.2., to read:

"3.6.2. For constant speed engines, the following 5-mode cycle shall be followed in dynamometer operation on the test engine:

Mode Number	Engine Speed	Percent Load	Weighting Factor
1	Rated	100	0.05
2	Rated	75	0.25
3	Rated	50	0.30
4	Rated	25	0.30
5	Rated	10	0.10

The load figures are percentage values of the torque corresponding to the prime power rating defined as the maximum power available during a variable power sequence, which may be run for an unlimited number of hours per year, between stated maintenance intervals and under the stated ambient conditions, the maintenance being carried out as prescribed by the manufacturer."

Paragraphs 3.6.2. to 3.6.6. (former), renumber as paragraphs 3.6.3. to 3.6.7.

Annex 5,

The title, amend to read:

"TECHNICAL CHARACTERISTICS OF REFERENCE FUEL PRESCRIBED FOR
APPROVAL TESTS AND TO VERIFY CONFORMITY OF PRODUCTION

Part 1. Agricultural and forestry tractor and non-road mobile machinery reference fuel for
CI engines type approved to meet limit values of power bands D to G

Note: Key properties ...

...."

After note 12, add the following title and table:

"Part 2. Agricultural and forestry tractor and non-road mobile machinery reference fuel for
CI engines type approved to meet limit values of power bands H to K

Parameter	Unit	Limits <u>1/</u>		Test Method
		minimum	maximum	
Cetane number <u>2/</u>		52.0	54.0	EN-ISO 5165
Density at 15°C	kg/m ³	833	837	EN-ISO 3675
Distillation:				
50 per cent point	°C	245	-	EN-ISO 3405
95 per cent point	°C	345	350	EN-ISO 3405
- Final boiling point	°C	-	370	EN-ISO 3405
Flash point	°C	55	-	EN 22719
CFPP	°C	-	-5	EN 116
Viscosity at 40°C	mm ² /s	2.3	3.5	EN-ISO 3104
Polycyclic aromatic hydrocarbons	per cent m/m	3.0	6.0	IP 391
Sulphur content <u>3/</u>	mg/kg	-	300	ASTM D 5453
Copper corrosion		-	class 1	EN-ISO 2160
Conradson carbon residue (10 per cent DR)	per cent m/m	-	0.2	EN-ISO 10370
Ash content	per cent m/m	-	0.01	EN-ISO 6245
Water content	per cent m/m	-	0.05	EN-ISO 12937
Neutralisation (strong acid) number	mg KOH/g	-	0.02	ASTM D 974
Oxidation stability <u>4/</u>	mg/ml	-	0.025	EN-ISO 12205

1/ The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 "Petroleum products – Determination and application of precision data in relation to methods of test" have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility).

Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels should nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify the questions as to whether a fuel meets the requirements of the specifications, the terms of ISO 4259 should be applied.

2/ The range for the cetane number is not in accordance with the requirements of a minimum range of 4R. However, in the case of a dispute between fuel supplier and fuel user, the terms of ISO 4259 may be used to resolve such disputes provided replicate measurements, of sufficient number to archive the necessary precision, are made in preference to single determinations.

3/ The actual sulphur content of the fuel used for the test shall be reported.

4/ Even though oxidation stability is controlled, it is likely that shelf life will be limited. Advice should be sought from the supplier as to storage conditions and life.

B. JUSTIFICATION

Following the agreement reached by GRPE at its fiftieth session, EUROMOT prepared this proposal aiming at the alignment of the provisions of UNECE Regulation No. 96 to the Stage III A provisions of EU Directive 2004/26/EC, taking into account the additional power bands H to K.
