Transmitted by the expert from
the JRC of the European Commission

Informal document No. **GRPE-58-11**
(58th GRPE, 8-12 June 2009,
agenda item 5)

CORRIGENDA

Working document ECE/TRANS/WP.29/GRPE/2009/16

Proposal for draft global technical regulation concerning the test procedure for compression-ignition (C.I.) engines to be installed in agricultural and forestry tractors and in non-road mobile machinery with regard to the emissions of pollutants by the engine

Submitted by the expert from the European Commission

Working document ECE/TRANS/WP.29/GRPE/2009/16 as deposited at GRPE secretariat on the 20 March 2009 and released 1 April 2009 with changes by the GRPE secretariat.

http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/grpedoc_2009.html

Part A and part B up to Annex 6 – Corrigendum

#	WHERE	ERRATA	CORRIGE
1	Short Title	EXHAUST EMISSIONS TEST PROTOCOL OF NON-ROAD MOBILE MACHINERY	EMISSIONS TEST PROTOCOL OF NON-ROAD MOBILE MACHINERY ENGINES
2	A.STATEMENT OF TECHNICAL RATIONALE AND JUSTIFICATION; 1.TECHNICAL AND ECONOMIC FEASIBILITY; Paragraph 7	Deposited text: The guidance document has no legal status<u>,</u> it does not introduce any additional requirements… in GRPE/2009/16: The guidance document has no legal status <u>as</u> it does not introduce any additional requirements…	The guidance document has no legal status <u>and</u> it does not introduce any additional requirements … [in order to maintain agreed content]
3	A. STATEMENT OF TECHNICAL RATIONALE AND JUSTIFICATION; 3. POTENTIAL COST EFFECTIVENESS; Paragraph 11	belive [incorrect spelling]	believe
4	page 1, footnote	wrong format [1]	<u>1/</u>
5	7.8.3.4.	Points with negative torque values have to be accounted for as zero work. [sentence mistakenly deleted]	[reintroduce] Points with negative torque values have to be accounted for as zero work.
6	Table 7.3, second column	Conditions (n = engine speed, T = torque) n_{ref} = 0 per cent and T_{ref} = 0 per cent and	Conditions (n = engine speed, T = torque) n_{ref} = 0 per cent and T_{ref} = 0 per cent and

		$T_{act} > (T_{ref} - 0.02\ T_{maxmappedtorque})$ and $T_{act} < (T_{ref} + 0.02\ T_{maxmappedtorque})$ $n_{act} \leq 1.02\ n_{ref}$ and $T_{act} > T_{ref}$ and $n_{act} > n_{ref}$ and $T_{act} \leq T_{ref'}$ and $n_{act} > 1.02\ n_{ref}$ and $T_{ref} < T_{act} \leq (T_{ref} + 0.02\ T_{maxmappedtorque})$ $n_{act} < n_{ref}$ and $T_{act} \geq T_{ref}$ and $n_{act} \geq 0.98\ n_{ref}$ and $T_{act} < T_{ref}$ and $n_{act} < 0.98\ n_{ref}$ and $T_{ref} > T_{act} \geq (T_{ref} – 0.02\ T_{maxmappedtorque})$ [4 and have to be replaced by or]	$T_{act} > (T_{ref} - 0.02\ T_{maxmappedtorque})$ and $T_{act} < (T_{ref} + 0.02\ T_{maxmappedtorque})$ $n_{act} \leq 1.02\ n_{ref}$ and $T_{act} > T_{ref}$ or $n_{act} > n_{ref}$ and $T_{act} \leq T_{ref'}$ or $n_{act} > 1.02\ n_{ref}$ and $T_{ref} < T_{act} \leq (T_{ref} + 0.02\ T_{maxmappedtorque})$ $n_{act} < n_{ref}$ and $T_{act} \geq T_{ref}$ or $n_{act} \geq 0.98\ n_{ref}$ and $T_{act} < T_{ref}$ or $n_{act} < 0.98\ n_{ref}$ and $T_{ref} > T_{act} \geq (T_{ref} – 0.02\ T_{maxmappedtorque})$
7	8.1.10.2.4	wrong subdivision in i, ii, iii; editor introduced subdivision where none should be	delete sub division
8	9.2.2	shall be maintained within one of the following ranges(option): (i) between 293 and 303 K (20 and 30 °C) or (ii) between 293 and 325 K (20 to 52°C) The range shall be selected by the Contracting Party. [the half sentence 'in close proximity to the entrance into the dilution tunnel' was lost copying the text from 9.2.3.2 during its introduction by the Editorial Committee]	shall be maintained within one of the following ranges (option): (a) between 293 and 303 K (20 and 30 °C) or (b) between 293 and 325 K (20 to 52°C) in close proximity to the entrance into the dilution tunnel. The range shall be selected by the Contracting Party. use missing half sentence from this paragraph 9.2.3.2
9	A.2.4. (b)	…that the σ_i are the errors	…that the ε_i are the errors

Annex A.7 – Corrigendum

#	WHERE	ERRATA	CORRIGE
1	Title Annex 7	Emission molar based calculation	Molar based emission calculation
2	Para A.7.0.1. footnote (2) 2nd line	x_{dil}	$x_{\mathrm{dil/exh}}$
3	A.7.0.1. footnote (2) 3rd line	x_{dil}	$x_{\mathrm{dil/exh}}$
4	Eq. (A.7-3)	$x_{\mathrm{H_2O}} = \frac{p_{\mathrm{H2O}}}{p_{\mathrm{abs}}}$	$x_{\mathrm{H2O}} = \frac{p_{\mathrm{H2O}}}{p_{\mathrm{abs}}}$
5	A.7.1.2.2.; A.7.1.2.3.	vapor [incorrect spelling]	vapour
6	Eq. (A.7-28)	$m_{\mathrm{gas}} = M_{\mathrm{gas}} \cdot \int \dot{n}_{\mathrm{exhwet}} \cdot x_{\mathrm{gaswet}} \cdot \mathrm{d}t$	$m_{\mathrm{gas}} = M_{\mathrm{gas}} \cdot \int \dot{n}_{\mathrm{exh}} \cdot x_{\mathrm{gas}} \cdot \mathrm{d}t$
7	Legend Eq. (A.7-28)	$\dot{n}_{\mathrm{exhwet}}$	$\dot{n}_{\mathrm{exh}}$
8	Legend of Eq. (A.7-28)	x_{gaswet} = instantaneous generic gas molar concentration	x_{gas} = instantaneous generic gas molar concentration on a wet basis
9	Eq. (A.7-29)	$m_{\mathrm{gas}} = M_{\mathrm{gas}} \cdot \int \dot{n}_{\mathrm{exhwet}} \cdot x_{\mathrm{gaswet}} \cdot \mathrm{d}t \Rightarrow$ $m_{\mathrm{gas}} = \frac{1}{f} \cdot M_{\mathrm{gas}} \cdot \sum_{i=1}^{\mathrm{N}} \dot{n}_{\mathrm{exhwet},i} \cdot x_{\mathrm{gaswet},i}$	$m_{\mathrm{gas}} = M_{\mathrm{gas}} \cdot \int \dot{n}_{\mathrm{exh}} \cdot x_{\mathrm{gas}} \cdot \mathrm{d}t \Rightarrow$ $m_{\mathrm{gas}} = \frac{1}{f} \cdot M_{\mathrm{gas}} \cdot \sum_{i=1}^{\mathrm{N}} \dot{n}_{\mathrm{exh}i} \cdot x_{\mathrm{gas}i}$
10	Legend Eq. (A.7-29)	$\dot{n}_{\mathrm{exhwet},i}$	$n_{\mathrm{exh}i}$
11	Legend Eq. (A.7-29)	$x_{\mathrm{gaswet},i}$ = instantaneous generic gas molar concentration	$x_{\mathrm{gas}i}$ = instantaneous generic gas molar concentration on a wet basis
12	Eq. (A.7-30)	$m_{\mathrm{gas}} = \frac{1}{f} \cdot M_{\mathrm{gas}} \cdot \sum_{i=1}^{\mathrm{N}} \dot{n}_{\mathrm{exhwet},i} \cdot x_{\mathrm{gaswet},i}$	$m_{\mathrm{gas}} = \frac{1}{f} \cdot M_{\mathrm{gas}} \cdot \sum_{i=1}^{\mathrm{N}} \dot{n}_{\mathrm{exh}i} \cdot x_{\mathrm{gas}i}$

13	Legend Eq. (A.7-30)	$\dot{n}_{\text{exhwet},i}$	$n_{\text{exh}i}$
14	Legend Eq. (A.7-30)	$x_{\text{gaswet},I}$ = instantaneous generic gas molar concentration	$x_{\text{gas}i}$ = instantaneous generic gas molar concentration on a wet basis
15	Eq. (A.7-31)	$m_{\text{gas}} = M_{\text{gas}} \cdot \bar{\dot{n}}_{\text{exhwet}} \cdot \bar{x}_{\text{gaswet}} \cdot t_{\text{cycle}}$	$m_{\text{gas}} = M_{\text{gas}} \cdot \dot{n}_{\text{exh}} \cdot \bar{x}_{\text{gas}} \cdot \Delta t$
16	Legend Eq. (A.7-31)	$\bar{\dot{n}}_{\text{exhwet}}$ = mean exhaust gas molar flow rate on a wet basis	$\dot{n}_{\text{exh}}$ = exhaust gas molar flow rate on a wet basis
17	Legend Eq. (A.7-31)	$\bar{x}_{\text{gaswet}}$ = mean gaseous emission molar fraction	$\bar{x}_{\text{gas}}$ = mean gaseous emission molar fraction on a wet basis
18	Legend Eq. (A.7-31)	t_{cycle} = test time interval	Δt = time duration of test interval
19	Eq. (A.7-32)	$m_{\text{gas}} = \frac{1}{f} \cdot M_{\text{gas}} \cdot \bar{x}_{\text{gaswet}} \cdot \sum_{i=1}^{N} \dot{n}_{\text{exhwet},i}$	$m_{\text{gas}} = \frac{1}{f} \cdot M_{\text{gas}} \cdot \bar{x}_{\text{gas}} \cdot \sum_{i=1}^{N} \dot{n}_{\text{exh}i}$
20	Legend Eq. (A.7-32)	$\dot{n}_{\text{exhwet},i}$	$n_{\text{exh}i}$
21	Legend Eq. (A.7-32)	$\bar{x}_{\text{gaswet}}$ = mean gaseous emission molar fraction	$\bar{x}_{\text{gas}}$ = mean gaseous emission molar fraction on a wet basis
22	Para A.7.3.2. 3rd line	x_{gaswet}	x_{gas}
23	Eq. (A.7-33)	$x_{\text{gasdry}} = \frac{x_{\text{gaswet}}}{1 - x_{\text{H2O}}}$	$x_{\text{gasdry}} = \frac{x_{\text{gas}}}{1 - x_{\text{H2O}}}$
24	Eq. (A.7-34)	$x_{\text{gaswet}} = \frac{x_{\text{gasdry}}}{1 + x_{\text{H2Odry}}}$	$x_{\text{gas}} = \frac{x_{\text{gasdry}}}{1 + x_{\text{H2Odry}}}$
25	Legend Eq. (A.7-34)	$x_{\text{H2O,dry}}$	x_{H2Odry}
26	Eq. (see A.7-29)	See above errata of Eq. (A.7-29)	See above corrige of Eq. (A.7-29)
27	Eq. (see A.7-31)	See above errata of Eq. (A.7-31)	See above corrige of Eq. (A.7-31)
28	Eq. (see A.7-32)	See above errata of Eq. (A.7-32)	See above corrige of Eq. (A.7-32)
29	A.7.4..4.1.(a):	Changing exhaust flow rate shall be extracted. [the first line of the paragraph has been lost while editing]	If a batch sample from a changing exhaust flow rate is collected, a sample proportional to the changing exhaust flow rate shall be extracted.
30	Eq. (A.7-45)	$m_{\text{PM}} = \bar{M}_{\text{PM}} \cdot \bar{\dot{n}} \cdot t_{\text{cycle}}$	$m_{\text{PM}} = \bar{M}_{\text{PM}} \cdot \dot{n} \cdot \Delta t$

31	Legend Eq. (A.7-45)	$\bar{\dot{n}}_i$ = mean exhaust molar flow rate	$\dot{n}$ = exhaust molar flow rate
32	Legend Eq. (A.7-45)	t_{cycle} = test interval	Δt = time duration of test interval
33	Legend eq. (A.7-46): *DR* 2nd line	m_{dil} ($DR = m/m_{dil}$)	$m_{dil/exh}$ ($DR = m/m_{dil/exh}$)
34	Legend Eq. (A.7-46): *DR* 2nd line	x_{dil}	$x_{dil/exh}$
35	Eq. (A.7-47)	$DR = \frac{1}{1 - x_{dil}}$	$DR = \frac{1}{1 - x_{dil/exh}}$
36	A.7.7.1. and A.7.7.2.	A.7.7.1. and A.7.7.2 [incorrect numbering]	replace numbering by A.7.6.4. and A.7.6.5.
37	A.7.8.1. to A.7.8.4.	A.7.8.1. to A.7.8.4. [incorrect numbering]	replace numbering by A.7.7.1. and A.7.7.4.

Annex A.8 – Corrigendum

#	WHERE	ERRATA	CORRIGE
1	Eq. (A.8-1)	$c_{NMHC} = \frac{c_{HC(w/oCutter)} \cdot (1 - E_{CH4}) - c_{HC(w/Cutter)}}{E_{C2H6} - E_{CH4}}$	$c_{NMHC} = \frac{c_{HC(w/oNMC)} - c_{HC(w/NMC)} \cdot (1 - E_{CH4})}{E_{C2H6} - E_{CH4}}$
2	Eq. (A.8-2)	$c_{CH4} = \frac{c_{HC(w/Cutter)} - c_{HC(w/oCutter)} \cdot (1 - E_{C2H6})}{E_{C2H6} - E_{CH4}}$	$c_{CH4} = \frac{c_{HC(w/NMC)} - c_{HC(w/NMC)} \cdot (1 - E_{C2H6})}{E_{C2H6} - E_{CH4}}$
3	Eq. (A.8-22)	$f_c = 0.5441 \cdot (c_{CO2d} - c_{CO2d}) + \frac{c_{COd}}{18,522} + \frac{c_{HCw}}{17,355}$	$f_c = 0.5441 \cdot (c_{CO2d} - c_{CO2d,a}) + \frac{c_{COd}}{18522} + \frac{c_{HCw}}{17355}$
4	Legend Eq. (A.8-22)	c_{CO2ad}	$c_{CO2d,a}$
5	Eq. (A.8-38)	$m_{ed} = \frac{1.293 \cdot t \cdot K_V \cdot p_P}{T^{0.5}}$	$m_{ed} = \frac{1.293 \cdot t \cdot K_V \cdot p_p}{T^{0.5}}$
6	Legend Eq. (A.8-38)	p_P	p_p
7	Eq. (A.8-39)	$m_{ed} = 1.293 \cdot V_0 \cdot n_P \cdot \frac{p_P}{101.3} \cdot \frac{273}{T}$	$m_{ed} = 1.293 \cdot V_0 \cdot n_P \cdot \frac{p_p}{101.3} \cdot \frac{273}{T}$
8	Legend Eq. (A.8-39)	p_P	p_p

9	Eq. (A.8-40)	$m_{\mathrm{ed}} = 1.293 \cdot q_{\mathrm{SSV}} \cdot \Delta t$	$m_{\mathrm{ed}} = 1.293 \cdot q_{V\mathrm{SSV}} \cdot \Delta t$
10	Eq. (A.8-41)	$q_{\mathrm{SSV}} = A_0 d_{\mathrm{V}}{}^2 C_{\mathrm{d}} p_{\mathrm{P}} \sqrt{\left[\frac{1}{T}\left(r_{\mathrm{p}}{}^{1,4286} - r_{\mathrm{p}}{}^{1,7143}\right) \cdot \left(\frac{1}{1 - r_{\mathrm{D}}{}^4 r_{\mathrm{p}}{}^{1,4286}}\right)\right]}$	$q_{V\mathrm{SSV}} = A_0 d_{\mathrm{V}}{}^2 C_{\mathrm{d}} p_{\mathrm{P}} \sqrt{\left[\frac{1}{T}\left(r_{\mathrm{p}}{}^{1.4286} - r_{\mathrm{p}}{}^{1.7143}\right) \cdot \left(\frac{1}{1 - r_{\mathrm{D}}{}^4 r_{\mathrm{p}}{}^{1.4286}}\right)\right]}$
11	Eq. (A.8-42)	$m_{\mathrm{ed},i} = 1.293 \cdot q_{\mathrm{SSV}} \cdot \Delta t_i$	$m_{\mathrm{ed},i} = 1.293 \cdot q_{V\mathrm{SSV}} \cdot \Delta t_i$
12	Legend Eq. (A.8-51)	m_{ed} = mass of equivalent diluted exhaust gas over the cycle [kg]	m_{ed} = mass of diluted exhaust gas over the cycle [kg]
13	Annex 8 appendix 1, A.8.1., A8.1.1. to A.8.1.3.	A.8.1., A8.1.1. to A.8.1.3. [incorrect numbering]	replace numbering by A.8.5., A.8.5.1 to A.8.5.3
14	Annex 8 appendix 2, A8.2	A8.2 [incorrect numbering]	replace numbering by A.8.6