Japan Proposal for amendment on WHDC GTR（ECE/TRANS/180/Add.4）

10-11. April.2008.

(1) Paragraph 7.7.2. Validation statistics of the test cycle

Table 3 Permitted point deletions from regression analysis amend to read

Condition	Points to be deleted
First 6 ± 1 seconds	Speed, torque, power
Full load demand and actual torque < 95 per cent reference torque	Torque and/or power
Full load demand and actual speed < 95 per cent reference speed	Speed and/or power
No load demand and actual torque > reference torque	Torque and/or power
Reference speed =0% and Reference torque =0% and -2 per cent of maximum mapped torque< actual torque<+2 per cent of maximum mapped torque	Speed and/or power
No load demand and reference torque < 0 per cent (motoring point)	Torque and/or power

Justification

The original gtr description "**No load demand and actual torque > ± 2 per cent of maximum torque (idle point)"** can be misread that gtr permits the case of actual torque > + 2 per cent of maximum torque (idle point).

(2) Paragraph 7.8.4.2. Analyzer response

The 3rd paragraph insert new sentence,

If a full flow dilution system is used, HC and NO_x shall be measured continuously in the dilution tunnel with a frequency of at least 2 Hz. The average concentrations shall be determined by integrating the analyzer signals over the test cycle. The system response time shall be no greater than 20 s, and shall be coordinated with CVS flow fluctuations and sampling time/test cycle offsets, if necessary. CO, CO_2, and NMHC may be determined by integration of continuous measurement signals or by analyzing the concentrations in the sample bag, collected over the cycle. The concentrations of the gaseous pollutants in the dilution air shall be determined by integration or by collecting into the background bag. ***The gaseous pollutants background level of the dilution air may be determined by sampling the dilution air prior to the entrance of the exhaust gas into the dilution tunnel. The measurement may be done prior to or after the test. If the measurement is done both at the***

beginning and at the end of the cycle, the values may be averaged.] All other parameters that need to be measured shall be recorded with a minimum of one measurement per second (1 Hz).

Justification

Background measurement of the gaseous pollutants in the dilution air using "Tunnel Blank" method is already used in Europe and Japan will adopt the method from 2009.

(3) Paragraph 9.4.3.5.Buoyancy correction

The 3rd paragraph amend to read,

The following equation shall be used:

$$m_{cor} = m_{uncor} \times \left\{ \frac{1 - \frac{\rho_a}{\rho_w}}{1 - \frac{\rho_a}{\rho_f}} \right\} \quad (71)$$

with

$$\rho_a = \frac{p_b \times 28.836}{8.3144 \times T_a} \quad (72)$$

where:

m_{uncor}	is the uncorrected particulate sample ***filter*** mass, mg
m_{cor}	***is the corrected particulate sample filter mass, mg***
ρ_a	is the density of the air, kg/m^3
ρ_w	is the density of balance calibration weight, kg/m^3
ρ_f	is the density of the particulate sampling filter, kg/m^3
p_b	is the total atmospheric pressure, kPa
T_a	is the air temperature in the balance environment, K
28.836	is the molar mass of the air at reference humidity (9.5 ***deg. C***), g/mol
8.3144	is the molar gas constant

Justification

In the original Equation (71) the buoyancy correction factor is multiplied only to the collected PM as follows.

$$. \; m_{\mathrm{f}} = m_{\mathrm{uncor}} \times \left(\frac{1 - \frac{\rho_{\mathrm{a}}}{\rho_{\mathrm{w}}}}{1 - \frac{\rho_{\mathrm{a}}}{\rho_{\mathrm{f}}}} \right) \qquad (71)$$

where:

m_{uncor} is the uncorrected particulate sample mass, mg

28.836 is the molar mass of the air at reference humidity (9.5 K), g/mol

The buoyancy affects not only to the collected PM but also to filter media.
9.5K is a mistype.

(4) Annex 6 A. EXAMPLE OF CALCULATION PROCEDURE

A.6.3.Particulate Emission (diesel fuel) amend to read

P_{bb} (kPa)	***P_{ba} (kPa)***	W_{act} (kWh)	$q_{mew,i}$ (kg/s)	$q_{mf,i}$ (kg/s)	$q_{mdew,i}$ (kg/s)	***mb_{uncor} (mg)***	***ma_{uncor} (mg)***	m_{sep} (kg)
99	***100***	40	0.155	0.005	0.0015	***90.0000***	***91.7000***	1.515

where

P_{bb} is atmospheric pressure at before test filter weighing, kPa

P_{ba} is atmospheric pressure at after test filter weighing, kPa

mb_{uncor} is the uncorrected particulate sample filter mass before test, mg

ma_{uncor} is the uncorrected particulate sample filter mass after test, mg

Step 1: Calculation of m_{edf} (paragraph 8.3.3.5.2.):

Equation (37): $r_{d,i} = \frac{0.002}{(0.002 - 0.0015)} = 4$

Equation (36): $q_{medf,i} = 0.155 \times 4 = 0.620$ kg/s

Equation (35): $m_{edf} = \sum_{i=1}^{1800} 0.620 = 1,116$ kg/test

Step 2: Buoyancy correction of the particulate mass (paragraph 9.4.3.5.)

Equation (72) : $\rho_{ab} = \frac{99 \times 28.836}{8.3144 \times 295}$ ***= 1.164 kg/m***^{3}

$$\rho_{aa} = \frac{100 \times 28.836}{8.3144 \times 295} = 1.176 \text{ kg/m}^3$$

where :

ρ_{ab} is the density of the air at before test filter weighing, kg/m^3

ρ_{aa} is the density of the air at after test filter weighing, kg/m^3

Equation (71) : $$mb_{cor} = 90.0000 \times \frac{\left(1 - 1.164 / 8000\right)}{1 - 1.164 / 2300} = 90.0325 \text{ mg}$$

$$ma_{cor} = 91.7000 \times \frac{1 - 1.176 / 8000}{1 - 1.176 / 8000} = 91.7334 \text{ mg}$$

$$m_f = ma_{cor} - mb_{cor} = 91.7334 - 90.0325 = 1.7009 \text{ mg}$$

Step 3: Calculation of the particulate mass emission (paragraph 8.3.3.5.2.):

Equation (34): $$m_{PM} = \frac{1.7009 \times 1116}{1.515 \times 1000} = 1.253 \text{ g/test}$$

Step 4: Calculation of the specific emission (paragraph 8.5.2.1.):

Equation (56): e_{PM} = 1.253 / 40 = 0.031 g/kWh

Justification

Buoyancy correction of the particulate mass is to correct the difference in air density of the weighting chamber before and after the test. Original gtr uses the same value, and It will be better to use different density for the “EXAMPLE OF CALCULATION” to better focusing and understanding.

(4) Annex 2

Table A.2.3. JAPAN DIESEL REFERENCE FUEL Amend to read

Property	Unit	Test method	Grade 1		Grade 2		Cert. Diesel	
			min.	max.	min.	max.	min.	max.
Cetane index		ISO 4264	50	-	45	-	*53*	*57*
Density at 15 °C	*kg/m^3*		-	-	-	-	*824*	*840*
Distillation		ISO 3405						
50 per cent Vol.	*°C*		-	-	-	-	*255*	*295*
90 per cent Vol.	°C		-	360	-	350	*300*	*345*
End point	*°C*		-	-	-	-	-	*370*
Flash point	°C	ISO 3405	50	-	50	-	*58*	-
Cold filter plugging point	°C	ICS 75.160.20	-	-1	-	-5	-	-
Pour point	°C	ISO 3015	-	-2.5	-	-7.5	-	-
Kinematic viscosity at 30 °C	mm^2/s	ISO 2909	2.7	-	2.5	-	*3.0*	*4.5*
Mass fraction of sulphur	per cent	ISO 4260	-	*0.001*	-	*0.001*	-	*0.001*
Volume fraction of total aromatics	*per cent v/v*	*HPLC*	-	-	-	-	-	*25*
Volume fraction of poly-aromatics	*per cent v/v*	*HPLC*	-	-	-	-	-	*5.0*
Mass fraction of carbon residue (10 per cent bottom)	mg	ISO 4260	-	0.1	-	0.1	-	-

Justification

Both industry standard for diesel fuel and recommended certification fuel specification in Japan amended in 2007.