

List of corrections made by IMMA to TRANS/WP.29/GRPE/2004/11 (gtr text)

Paragraphs

3. Definitions

- 3.1.1. Modify to read: "...as prescribed in paragraph **3.3.**, of this regulation"
- 3.1.2. Engine and vehicle characteristics

Add the following

Subject to the provisions of paragraph 6.2.1., the engine and vehicle characteristics as defined in annex 4 to this regulation.

[Note: Otherwise this is too restrictive for existing "worst case" procedures, in the European, the USA's 40 CFR Part 86 sub-part E and the Japanese TRIAS regulations. see § 6.2.1 below]

- 3.2.1. Correct the symbol " **m_k** " to the definition of the Kerb mass
- 3.3. Correct the symbol " **m_{ref}** " to the definition of the Reference mass

6. Test conditions

Add the new paragraph 6.1.:

6.1 Test room and Soak area

6.1.1. Test room

The test room with the chassis dynamometer and the gas sample collection device, shall have a temperature of 298 K \pm 5 K (25°C \pm 5°C)

The room temperature shall be measured twice in the vicinity of vehicle cooling blower (fan), both before and after the Type 1 test.

6.1.2. Soak area

The soak area shall have a temperature of 298 K \pm 5 K (25°C \pm 5°C) and be able to park the test vehicle (motorcycle) to be preconditioned in accordance with 7.2.4. "

6.2.1. General

Amend read:

"The test vehicle (motorcycle) shall conform in all its components with the production series, or, if the motorcycle is different from the production series, a full description shall be given in the test report. In selecting the test vehicle, the manufacturer and test authority shall agree which motorcycle model is representative of the relevant family of vehicles."

6.2 Renumber the following paragraphs as follows:

- 6.2. Test vehicle
 - 6.2.1. General:
 - 6.2.2. Run-in

- 6.2.3. Adjustments
- 6.2.4. Test mass and load distribution
- 6.2.5. Tyres
- 6.3. Vehicle classification
 - 6.3.1. Class 1
 - 6.3.2. Class 2
 - 6.3.3. Class 3
- 6.4. Specification of the reference fuel
- 6.5. Type I tests
 - 6.5.1. Rider
 - 6.5.2
 - 6.5.2.1
 - 6.5.2.2
 - 6.5.2.3
 - 6.5.2.4
 - 6.5.2.4.1
 - 6.5.2.4.2
 - 6.5.2.4.3.
 - 6.5.2.5
 - 6.5.3
 - 6.5.3.1
 - 6.5.3.12.
 - 6.5.4.
 - 6.5.4.1.
 - 6.5.4.2.
 - 6.5.5.

New 6.3. Vehicle classification

Add the following sentence: **“The numerical values of the engine capacity and v_{\max} shall not be rounded up or down”**

New 6.3.1 Class 1

Amend to read: “engine capacity $\leq 50\text{cm}^3$ and $50\text{km/h} < v_{\max} \leq 60\text{km/h}$ subclass 1-1”

New 6.5.3 Exhaust gas measurement system

Add a new figure 6-2 as follows:

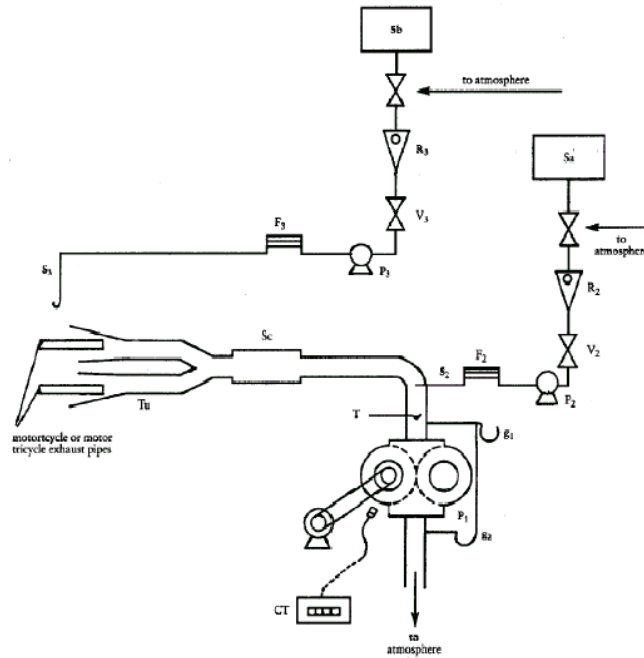


Figure 6-2: Equipment for sampling the gases and measuring their volume

New 6.5.3.5. Modify the sentence : “A device (**T**) to allow continuous recording of the **temperature of the** diluted exhaust mixture entering the pump”

New 6.5.3.8 Modify paragraph reference : “The minimum sample flow rate in the two sampling devices described above and in paragraph 6.5.3.7 shall be at 150 litre/hour.”

New 6.5.4. Driving schedules

New 6.5.4.1. Test cycles

Modify paragraph reference : **6.3** instead of 6.2

Modify paragraph reference : **5.0** instead of 9.2

New 6.5.4.2. Speed tolerances

Modify paragraph reference : **6.5.4.1** instead of 6.4.4.1

Modify Figure Reference : **6.3** instead of 6.1

New 6.5.5.2.1. Step 1 – Calculation of shift speeds

Amend to read: "Upshift speeds (**$v_{1 \rightarrow 2}$ and $v_{i \rightarrow i+1}$**) in km/h during acceleration phases **shall be** calculated using the following formulas:

Equation 6-1:

$$v_{1 \rightarrow 2} = \left[(0.5753 \times e^{(-1.9 \times \frac{P_n}{m_k + 75})} - 0.1) \times (s - n_{idle}) + n_{idle} \right] \times \frac{1}{ndv_1}$$

Equation 6-2:

$$v_{i \rightarrow i+1} = \left[(0.5753 \times e^{(-1.9 \times \frac{P_n}{m_k + 75})}) \times (s - n_{idle}) + n_{idle} \right] \times \frac{1}{ndv_1}, I = 2 \text{ to } ng-1$$

where:

i is the gear number (≥ 2),

ng is the total number of forward gears,

P_n is the rated power in kW,

m_k is the kerb mass in kg,

~~**n** is the engine speed in min^{-1} ;~~

n_{idle} is the idling speed in min^{-1} ,

s is the rated engine speed in min^{-1} ,

ndv_i is the ratio between engine speed in km/h and vehicle speed in min^{-1} in gear **i**.

Downshift speeds ($v_{i \rightarrow i-1}$) in km/h during cruise or deceleration phases in gears **3 (third gear)** to **n** shall be calculated using the following formula:

Equation 6-3:

$$v_{i \rightarrow i-1} = \left[(0.5753 \times e^{(-1.9 \times \frac{P_n}{m_k + 75})}) \times (s - n_{idle}) + n_{idle} \right] \times \frac{1}{ndv_{i-2}}, i = 3 \text{ to } ng$$

The gear lever shall be set to first gear but the clutch shall be disengaged, if:

- the vehicle speed drops below 10 km/h or
- the engine speed drops below $n_{idle} + 0.03 \times (s - n_{idle})$;
- engine roughness is evident,
- engine stalling is imminent."

New 6.5.5.2.3. Step 3 – Corrections according to additional requirement

Reword: "d) No downshift to first gear at a transition from a deceleration or a cruise phase to an acceleration phase, if "no use of first (No.1) gear" is indicated."

and: "To give the test engineer more flexibility and to assure driveability, the use of gears **other** than **those** calculated with the routines above (**Note 4**) are permitted in any cycle phase. **If the above routines do not enable a clear gear selection to be made, the manufacturer's recommendations for gear use shall be followed.**

Note 4: The Excel calculation sheets for selecting the gear to be used may be found on the UN website at: <http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/wmtc.html>

New 6.5.6. Dynamometer settings

Modify paragraph reference : 6.5.7 instead of 6.4.7

New 6.5.6.1.1. Requirements for the equipment

Modify Paragraph Reference : 6.5.6 instead of 6.4.6

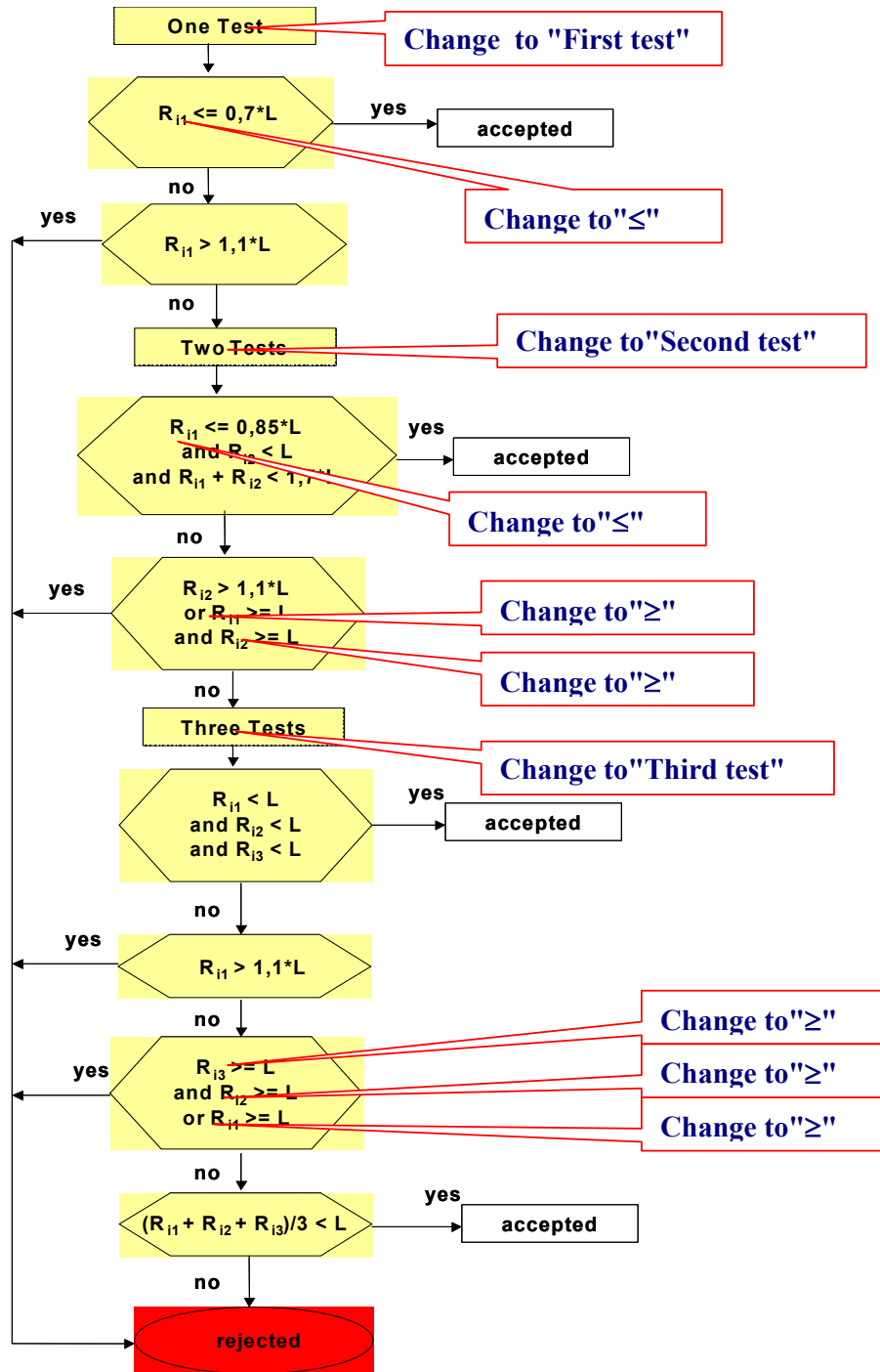
7.1.1.1 Modify Paragraph Reference : 7-2 instead of 7-1

7.1.1.2 Number of tests

Amend to read:

“The number of tests shall be determined as shown in figure 7-1. R_{i1} to R_{i3} describe the final measurement results for **the first (No.1) test to the third (No.3) test** and the gaseous pollutant, the carbon dioxide emission or fuel consumption as defined in paragraph 8.1.1.6. L is the limit value as defined in paragraph 5.”

and correct Figure 7-1 as follows:



7.2.4. Test vehicle (motorcycle) preconditioning

Amend to read:

“..... The vehicle shall be stored for not less than 6 hours and not more than 36 hours prior to the cold start Type I test or until the engine oil temperature **T^O** or the coolant temperature **T^C** or **sparkplug seat/gasket temperature T^P (only for air cooled engine)** equals the air temperature of the soak area.”

8.1. Type I tests

Delete Paragraph heading 8.1.1 and renumber the sub-paragraphs

Present 8.1.1.1. Analysis of the samples contained in the bags

Replace “**bags A,B**” by “**bag A,B**”

Present 8.1.1.4.2. Hydrocarbons

Modify DHC value : **0,577** instead of 0,619

Present 8.1.1.4.3. Carbon monoxide

Modify **dCO** value : **1.17** kg/m³ instead of 1,250

Present 8.1.1.4.4. Nitrogen oxides

Modify **dNO_2** value : **1.91** kg/m³, instead of 0,619

Present 8.1.1.4.5. Carbon dioxide

Modify **dCO_2** value : **1.83** g/m³, instead of 1830,0

Present 8.1.1.4.6. Dilution factor DF

Amend to read: “**where CO, CO₂**”

9. Records required

Amend to read:

f) “..... recommended **engine speed at idle, nominal.....**”

“.....Note 6: A central laboratory barometer may.....”

“.....Note 7: If conditioning columns are not used this measurement can be deleted.....”

Annex 7 : paragraph 4:

Amend to read:

“..... **provided that the coastdown time accuracy according to paragraph 6.6.7 in this regulation is ensured**”

Paragraphs:

4. Cycle development

Many of the Tables are actually Figures and should be relabelled, eg 2, 5, 6 etc

4.5. Modifications of the draft test cycle and final version

Insert after Table 16:

“JARI analysed the four-mode frequency (idling, acceleration, deceleration and cruising) in relation to the in-use data and the WMTC driving cycle, as summarised in the following tables.

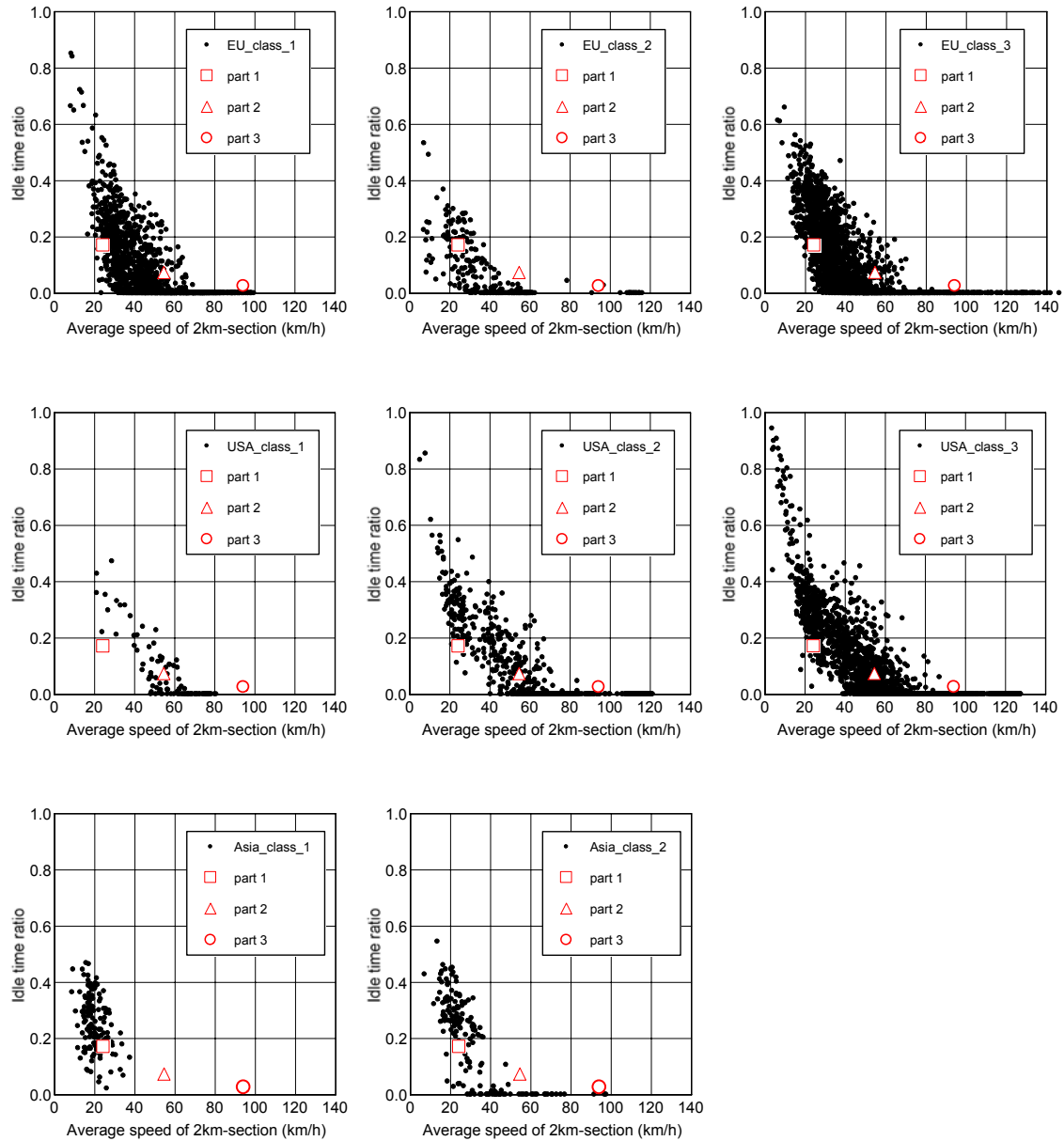


Figure X Comparison between WMTC cycles and In-use data for Idling time ratio

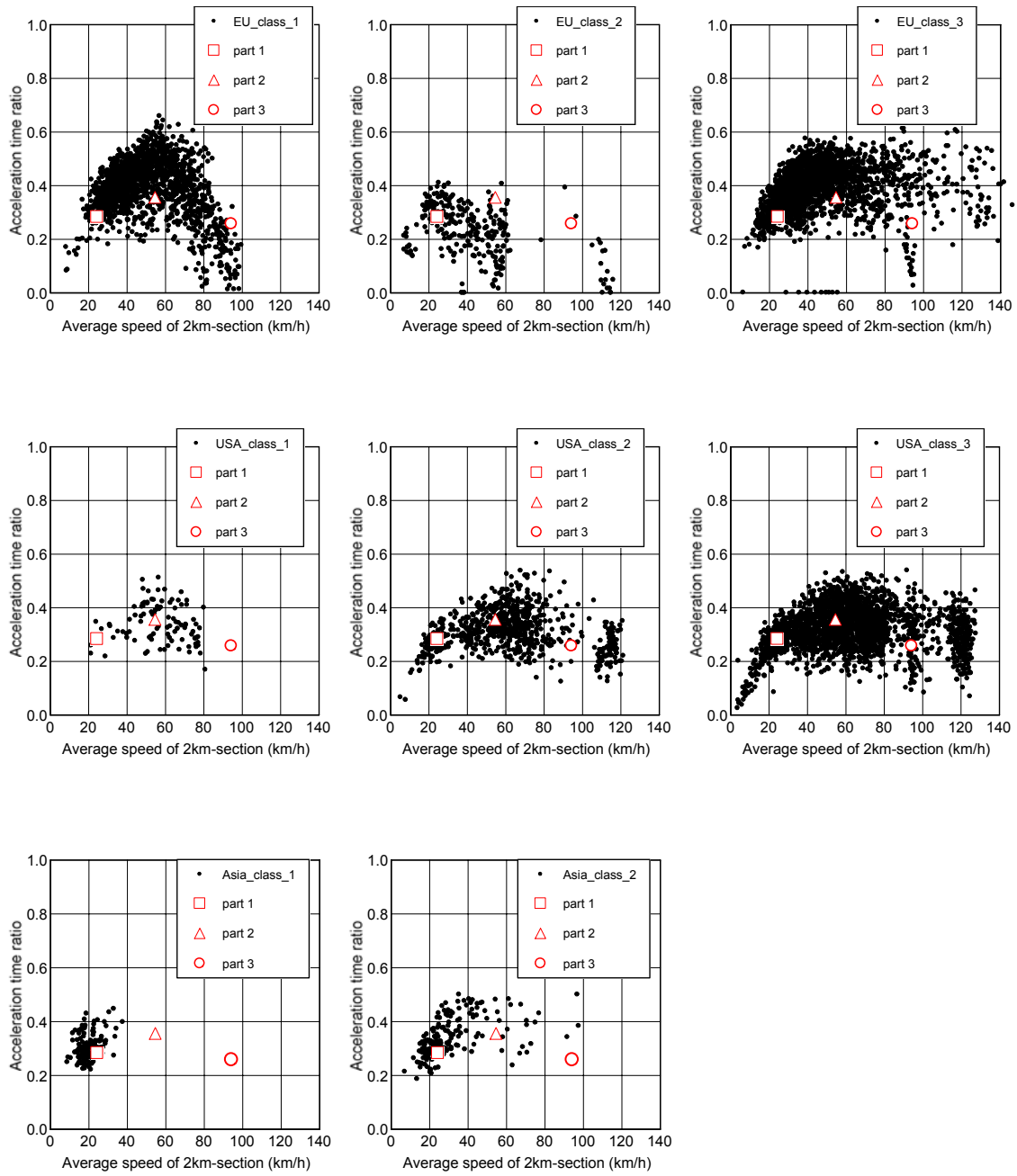


Figure XX Comparison between WMTC cycles and In-use data for acceleration time ratio

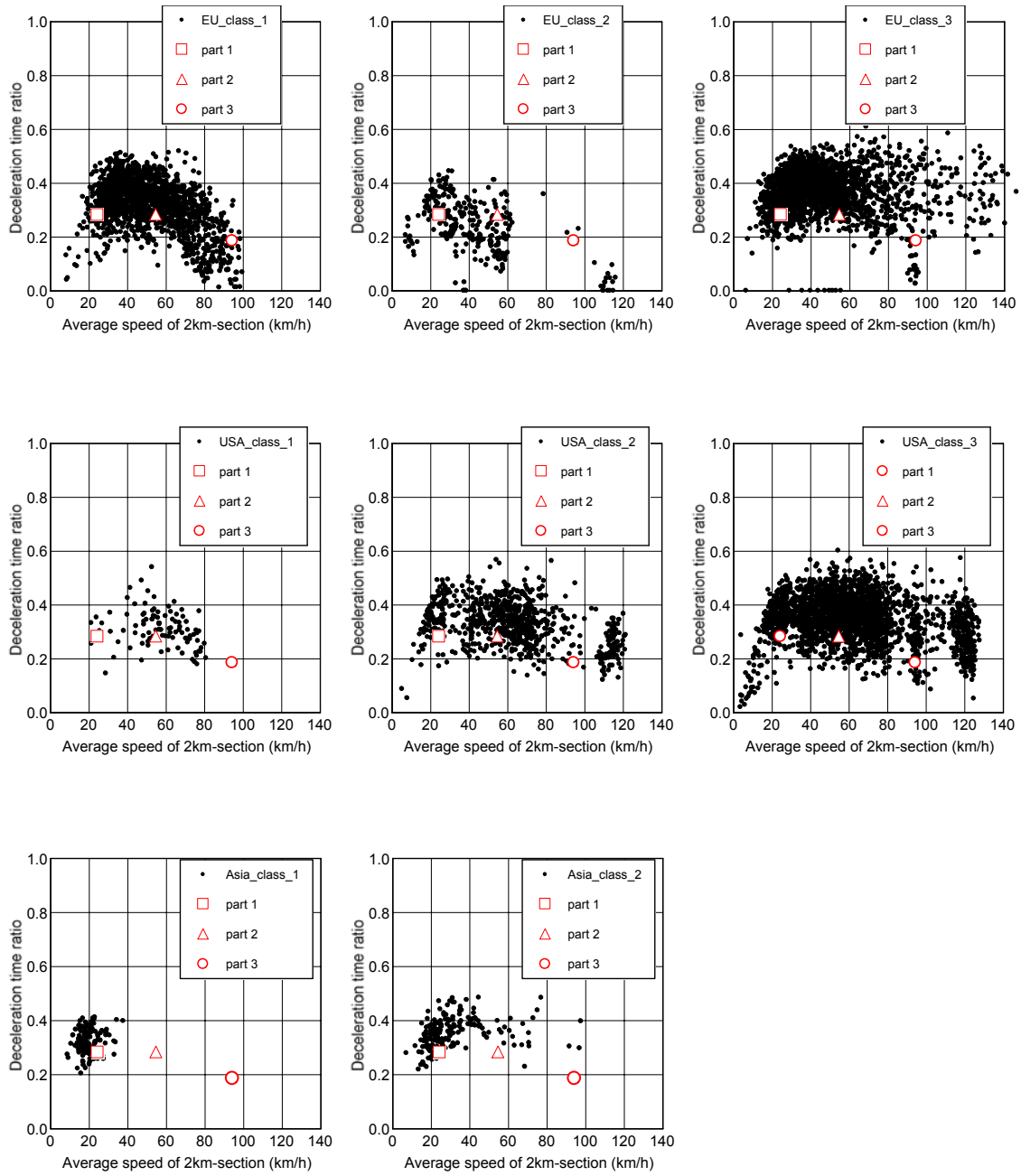


Figure XXX Comparison between WMTc cycles and In-use data for deceleration time ratio

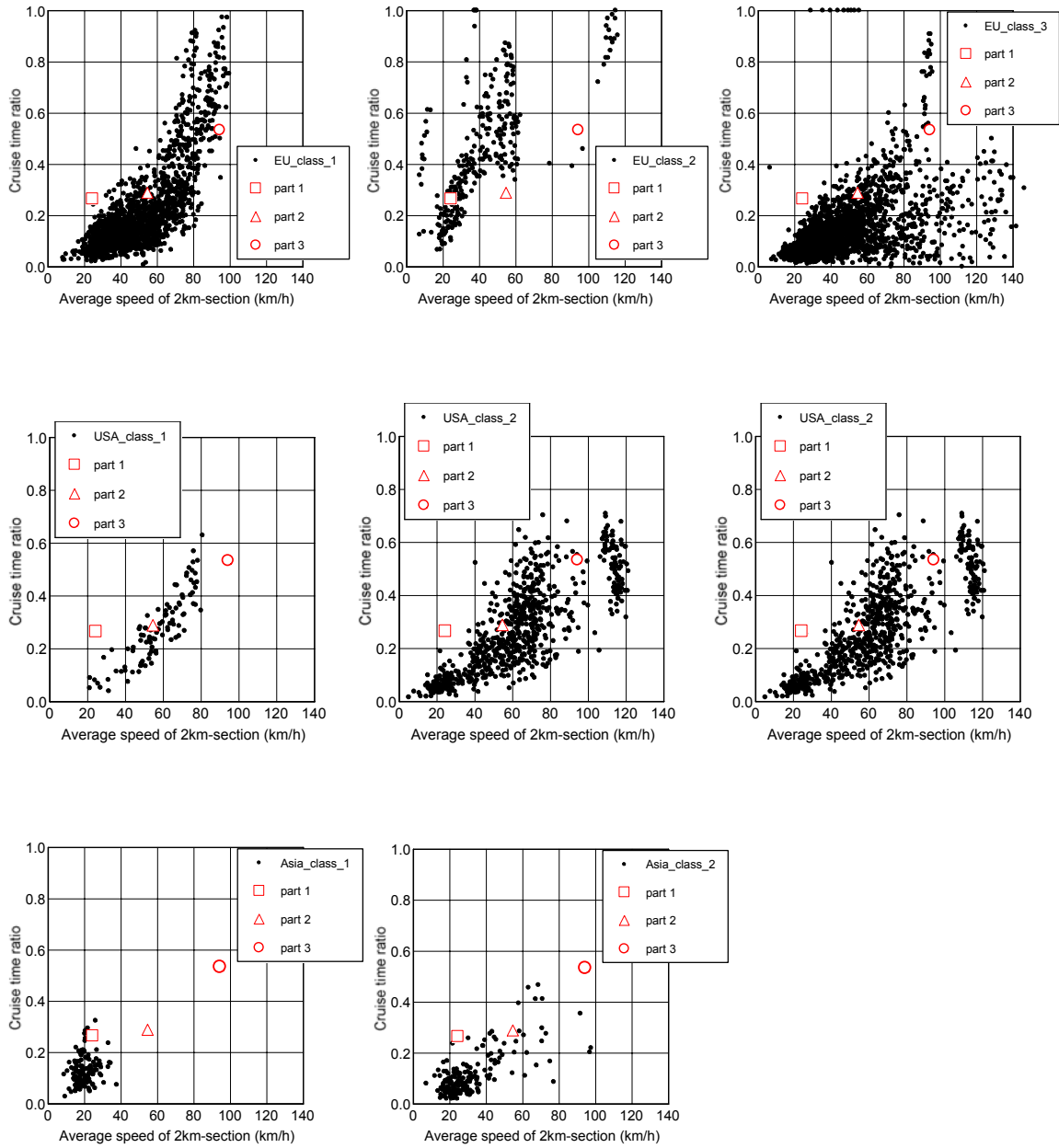


Figure XXXX Comparison between WMTC cycles and In-use data for cruising time ratio

5.2. Gearshift criteria, additional requirements

Modify the equations as follows:

$$n_{max_acc}(i) = (0.5753 \times e^{(-1.9 \times \frac{P_n}{m_k + 75})}) \times (s - n_{idle}) + n_{idle} \quad \text{Equation 2}$$

P_n - rated power in kW

m_k - kerb mass in kg

~~n - engine speed in min^{-1}~~

n_{idle} - idling speed in min^{-1}

s - rated engine speed in min^{-1} at maximum power

i - gear number (≥ 2)

$$n_{min_acc}(i) = n_{man_acc}(i-1) \times \frac{r(i)}{r(i-1)} \quad \text{Equation 3}$$

$r(i)$ - ratio of gear i

$$n_{min_dec}(i) = n_{min_dec}(i-1) \times \frac{r(i)}{r(i-1)} \quad \text{Equation 4}$$

$r(i)$ - ratio of gear i

Modify the eighth paragraph under additional requirements to read:

"- For those modes that require the vehicle to decelerate to zero, manual transmission clutches shall be disengaged when the speed drops below 10 km/h, when the engine speed drops below $n_{idle} + 0.03 \times (s - n_{idle})$ when engine roughness is evident, or when engine stalling is imminent."

5.3. Gearshift prescriptions

5.3.1 Modification of the following equations :

Upshift speeds in km/h during acceleration phases:

$$v_{1 \rightarrow 2} = \left[(0.5753 \times e^{(-1.9 \times \frac{P_n}{m_k + 75})} - 0.1) \times (s - n_{idle}) + n_{idle} \right] \times \frac{1}{ndv_1} \quad \text{Equation 5}$$

$$v_{i \rightarrow i+1} = \left[(0.5753 \times e^{(-1.9 \times \frac{P_n}{m_k + 75})}) \times (s - n_{idle}) + n_{idle} \right] \times \frac{1}{ndv_1} \quad , i = 2 \text{ to } ng-1$$

Equation 6

gear number (≥ 2),

ng is the total number of forward gears,

P_n is the rated power in kW,

m_k is the kerb mass in kg,

~~n is the engine speed in min^{-1}~~ ,

n_{idle} is the idling speed in min^{-1} ,

s is the rated engine speed in min^{-1} ,

ndv_i is the ratio between engine speed in km/h and vehicle speed in min^{-1} in gear i .

Downshift speeds in km/h during cruise or deceleration phases in gears 3 to n:

$$v_{i \rightarrow i-1} = \left[(0.5753 \times e^{(-1.9 \times \frac{P_n}{m_k + 75})}) \times (s - n_{idle}) + n_{idle} \right], i = 3 \text{ to } ng-1$$

Equation 7

the gear lever shall set to first gear and the clutch shall be disengaged, if:

- the vehicle speed drops below 10 km/h, or
- the engine speed drops below $n_{idle} + 0.03 \times (s - n_{idle})$.
- engine roughness is evident,
- engine stalling is imminent.

5.3.2

5.3.2.1. Gear lever in neutral and clutch disengaged

Amend the last condition to read :

“the engine speed drops below $n_{idle} + 0.03 \times (s - n_{idle})$ ”

5.3.2.2. Gear choice for acceleration phases

- Gear = 6, if $v > v_{5 \rightarrow 6}$,
- Gear = 5, if $v > v_{4 \rightarrow 5}$,
- Gear = 4, if $v > v_{3 \rightarrow 4}$,
- Gear = 3, if $v > v_{2 \rightarrow 3}$,
- Gear = 2, if $v > v_{1 \rightarrow 2}$,
- Gear = 1, if $v \leq v_{1 \rightarrow 2}$.

5.3.2.3. Gear choice for deceleration or cruise phases

- Gear = 6, if $v > v_{4 \rightarrow 5}$,
- Gear = 5, if $v > v_{3 \rightarrow 4}$,
- Gear = 4, if $v > v_{2 \rightarrow 3}$,
- Gear = 3, if $v > v_{1 \rightarrow 2}$,
- Gear = 2, if $v \leq v_{1 \rightarrow 2}$.

5.4. Calculation example

Correct the symbol : “These values can also be used to calculate the affiliated vehicle speeds (vehicle shift speed in gear i = engine shift speed in gear i / n/v_i).”

Modification of the notes to Table 21

ndv means the ratio between engine speed in min^{-1} and vehicle speed in km/h

pmr means the power to mass ratio calculated by $P_n / (m_k + 75) \times 1000$, P_n in kW, m_k in kg

8. Weighting Factors for an overall WMTC emission result

Modification of Table 27

Vehicle class	Cycle	Weighting	
Class 1	Part 1, cold	w_1	50 per cent
	Part 1, hot	w_{1hot}	50 per cent
Class 2	Part 1, cold	w_1	30 per cent
	Part 2, hot	w_2	70 per cent
Class 3	Part 1, cold	w_1	25 per cent
	Part 2, hot	w_2	50 per cent
	Part 3, hot	w_3	25 per cent

11. Round Robin

Add a cross reference to the full round-robin report on the UN website in Section 11.
