IMMA answers to the 13th IWG ASEP comments
History

- Sept. 2016: GRB-64-23e-Rev.1 (Chair) Revised draft Terms of Reference of IWG ASEP. Note: R41 excluded
- Sept 2017: GRB-66-12 by Germany: problems with noise emissions from L-cat:
  - NORESS
  - “Grey Areas”
- March 2018, at (EU) MCWG, ACEM presented 1st ASEP concept in reaction to the 1st Euro 5 noise study, proposing to enlarge the test range, any gear, any throttle.
- Sept 2018, GRB/68:
  - German proposal for 02 Series of amendments for R92 introducing ASEP for NORESS (adopted March WP.29)
  - IMMA proposal for supplement 7 to R41/04, making ASEP mandatory (adopted at March WP.29),
  - Annex III to the report of GRB-68: Revised ToR now also including R41
- Sept 2018: ASEP-09-05 IMMA inputs, including proposal to revise R41-ASEP, in line with above ‘contour’
- Nov 2018: ASEP-10-07: IMMA model study:
  - “Starting a completely new ASEP approach (currently not engineered for motorcycles) will need new limits as well and is not expected to meet the timeline”
  - “In the meantime, IMMA will cooperate in the further development of the model to make it suitable for motorcycles, for consideration at a later date”
- Jan 2019, on the side of GRB/69, IMMA presented 1st draft proposal for ASEP revision towards Real-Driving ASEP (ASEP 2.0) informally to stakeholders
- Apr. 2019: ASEP-11-06 & ASEP-11-05 (IMMA) R41 RDN ASEP 2.0 proposal, in line with above ‘contour’
- July 2019: ASEP-12-07 rev2 (IMMA) MC_ASEP_2-0 rev1
- Sept 2019: ASEP-13-05 (IMMA) R41-05 amendment proposal, draft ASEP 2.0-rev1
Timeline: Euro 5

- **2019**: Euro 5, 2nd study
- **2020**: Co-decision
- **2021**: Entry into force Euro 5
- **2022**: EC proposals
- **2023**: Target Entry into force Euro 5+
- **2024**: ASEP 2.0

- **2019**
  - GRB/71
- **2020**
  - GRB/72
  - GRB/73
  - GRB/74

- **2021**
  - Co-decision

- **2022**
  - Target Entry into force = together with the 2\textsuperscript{nd} Euro 5 stage (Emissions & OBD-II)

- **2023**

- **2024**

- **2\textsuperscript{nd} Euro 5 noise study about to start**

- Acknowledgement & acceptance of ASEP 2.0 is necessary A.S.A.P for inclusion in the 2\textsuperscript{nd} Euro 5 study

- **+ external (EU public) pressure for stricter noise regulation**

- Limited time to explore drastic changes in procedure or limits
‘real world’ coverage of the R41 ASEP2.0 proposal
According to survey of real-world’s traffic in Germany, the most typical rpm in actual operation is $S \times 80\% \ (PMR=100)$ even in rural area.
### ASEP range Real world coverage: Vehicle & test details

<table>
<thead>
<tr>
<th>vehicle ID</th>
<th>38</th>
<th>39</th>
<th>40</th>
<th>41</th>
<th>48</th>
<th>51</th>
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<td>cruiser</td>
<td>tourer</td>
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<td>On/Off</td>
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<td>V2</td>
<td>B2</td>
<td>V2</td>
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<td>L1</td>
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<td>PMR(kW/t)</td>
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<td>117</td>
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<td>126,6</td>
<td>130,7</td>
<td>222</td>
<td>283,3</td>
<td>389,1</td>
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<td>165</td>
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<td>142</td>
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<td>7000</td>
<td>5200</td>
<td>7250</td>
<td>7800</td>
<td>8000</td>
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<td>12500</td>
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<td>10500</td>
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<td>max speed in run</td>
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<td>99,05</td>
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<td>2035</td>
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<td>5800</td>
<td>6240</td>
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<td>7280</td>
<td>7200</td>
<td>10000</td>
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<td>80</td>
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<td>100</td>
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</table>

Not all ‘gentle’ driving styles
### ASEP range Real world coverage (% time):

<table>
<thead>
<tr>
<th>Vehicle ID</th>
<th>38</th>
<th>39</th>
<th>40</th>
<th>41</th>
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<th>51</th>
<th>61</th>
<th>64</th>
<th>65</th>
<th>80</th>
<th>81</th>
<th>85</th>
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<tr>
<td>A low rpm/ highway speeds</td>
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<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
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<tr>
<td>B mid rpm/ highway speeds</td>
<td>12.2</td>
<td>12.5</td>
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<td>28.7</td>
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<td>3.1</td>
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<tr>
<td>D low rpm/urban&amp; extra urban speed</td>
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<td>13.0</td>
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<td>26.6</td>
<td>35.1</td>
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<tr>
<td>E ASEP coverage</td>
<td>71.6</td>
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<td>0.0</td>
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<td>1.8</td>
<td>4.1</td>
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<td>15.5</td>
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<tr>
<td>H mid rpm/low speed</td>
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<td>0.3</td>
<td>0.3</td>
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<td>0.1</td>
<td>0.7</td>
<td>1.0</td>
</tr>
<tr>
<td>I high rpm/low speed</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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</tr>
</tbody>
</table>

ASEP are has major coverage of 'real driving' speed 80 / 100kmh

Other 'larger' coverage parts are not in critical areas: Low Rpm or highway speeds

Low share of > 0.8 x S
ASEP range Real world coverage: RPM frequency analysis (% time within ASEP)

Vehicle 51: S = 5200rpm

Real world driving: little time spent at high RPM
Linear behavior & 5dB/1000rpm

Motorcycle A
PMR = 444
S = 11000min⁻¹
n_idle = 1100min⁻¹

Motorcycle C
PMR = 520
S = 13000min⁻¹
n_idle = 1200min⁻¹
Linear behavior & 5dB/1000rpm

PMR 250

PMR >400

PMR 165, touring
Linear behavior & 5dB/1000rpm

PMR 440
Vehicle with flap system

Supersport vehicle (PMR > 500) with flexibility measures according to ASEP 2.0 boundaries conditions
Appropriateness of nPP:

Vehicle A: PMR=217

Vehicle B: PMR=353

Vehicle C: PMR=192

nPP’ shows higher correlation

As agreed in 13th Informal Group on R41 (Geneva, 23-24 April 2009) - Minutes 03-R41WG^09a2e
Example: "Backfire" at stationary noise test

From throttle closing to "backfire" = 0.22s

"BB' + 10m" is sufficient for measuring "Backfire" during acceleration tests

Max $n_{BB'} = 100\text{km/h}$

$\Rightarrow$ Max distance from throttle closing to "backfire" = $100\text{km/h} \times 0.22s = 6\text{m}$
Thank you