Report
GRB ad hoc Working Group
ASEP

VS 14 febr

issued by the Chairman of the ASEP WG
GRB 51; February 2010
Meetings:  (21)

1. Amsterdam
   2005 November
2. The Hague
   2006 January
3. Geneva
   2006 February
4. Geneva
   2006 February
   3 a-d Task Force
   2006 Feb-Aug
5. The Hague
   2006 September
6. Geneva
   2006 November
7. The Hague
   2007 February
8. The Hague
   2007 May
9. Ann Arbor USA
   2007 October
10. Geneva
    2008 January
11. Tokyo
    2008 February
12. Geneva
    2008 June
13. Paris
    2008 September
    13a. Expert group Paris
14. Paris
    2008 November
15. Flensburg (Ger.)
    2008 December
16. Paris
    2009 January
17. Madrid
    2009 May
18. Paris
    2009 December
Reminder: why ASEP

• Annex 3 covers the part of the engine map with lower revs

• Decision made to have Additional Sound Emission Provisions to cover a wider part of the engine map (higher revs).
Why ASEP? (2)

In old days: no sound design
So one point in engine map is enough →
Vehicles behaved +/- lineair →
Firsts noise directives were sufficient

Wit sound design:
relation revs ↔ noise is free
→ One point not enough any more
3. The informal group **shall develop** a complementary test method and evaluation criteria for insertion into Annex 10. The complementary test method shall cover the noise emission under higher engine speeds and loads than the proposed procedure in TRANS/WP.29/GRB/2005/5, as amended.
ToR

The informal group shall develop:

• a complementary test method

• evaluation criteria for insertion into Annex 10.

That was exactly our mission for Paris
The Basics

The issue is rather complex

But the basic is simple:

A line in the engine map

How higher the line, how less stringent

Where to draw the line: that’s all
Remember:
What should ASEP detect?

- Noise emission higher than expected reference curve
  - Non linear
  - Too high Lmax
  - Too high slope
What should ASEP detect?

- Where to draw the limit line: that’s the question
That’s all?

YES!, (but very complex)
Deliverables meeting 16

SHOULD BE

1. One method in the formal wording
2. A limitation proposal based on an analyses
BUT WHAT DO YOU GET?

1. One remaining issue: N1 vehicles
   – Discussion paper exclusion distributed

2. One document (GRB xxxx)
   – with the generals
   – with one method, not ready
     • proposed/developed by OICA,
     • discussed in the group
   – with one ready: NL (could be optimized)

3. A stringency analyses
BUT WHAT DO YOU GET?

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N1’s and ASEP

N1’s make a lot of sound
In the NL: 17% of the fleet makes 50% of traffic noise in towns

So hot issue: for Annex 3 limitation
N1 and ASEP

• Hardly private owners
• Not bought by emotion, but chosen on ‘costs’ by administrators/lease companies
• No customer demands for sound
• Much more variants as with M1’s → high costs for industry
• No sound design noticed
N1: ASEP relevant? (2)

Plee in the group for exemption
Positive attitude
Proposal made, no time enough for a perfect job.

So we provided a paper with the possibilities, options and preferences
BUT WHAT DO YOU GET?

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Generals

Ready
Main body, measurement method, COP
Method 1 (OICA)

1. Procedure not ready:
   yes/no bonus silent vehicles

2. No limitation proposal
Method 1: relevance of the bonus

Silent vehicles become ‘normal’ in higher revs area.

In Method 1 ‘jumps’ are punished

With bonus: silent vehicles will pass tougher limitation options

Without the bonus → more vehicles are rejected → supports weaker limitation
Effect of bonus on silent vehicles
example vehicle: 5,5 dB under Annex 3 limit (veh 1-26)

Without bonus
OICA proposal becomes critical
$\Delta = 0,4$ dB(A)

With bonus
OICA proposal is uncritical
$\Delta = 6$ dB(A)
Method 1 investigates relative, not absolute noise emission

Vehicle 1-26
Lmax in control range = 76 dB(A)
OICA proposal becomes critical
$\Delta = 0,4 \text{ dB(A)}$

Vehicle 200-13
Lmax in control range = 95 dB(A)
OICA proposal is uncritical
$\Delta = 3,4 \text{ dB(A)}$
Method 1 (OICA)

Characteristics:

Self adjusting: more severe for silent vehicles; more lenient for ‘soundy’ vehicles

Anchor point, margin, slope, edging

No limitation proposal
Edging

Edging = Extra slope:
intended to compensate inaccuracy

with a ‘tough’ slope: it might be needed

With a liberal slope: makes it even more liberal
Method 2 (NL formal proposal)

Anchor point based on limit annex 3

Not To Exceed level (NTE)

Line between anchor point and NTE level

Below anchor point: slope (-3)
BUT WHAT DO YOU GET?

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3. A stringency analyses
Stringency Analysis

How:

1. vehicles of concern
2. relation with present demands
Vehicles of Concern

Defined by mr Steven, VDA and NL

Also defined:

• Vehicles with a high potential for increase
• Vehicles of no concern
Highlights Stringency Analysis

Method 1.
With limitation option Japan:
   – 5 vehicles are rejected,
   – 4 of these 5 are already rejected by Annex 3

With tougher limitation: more vehicles are rejected
Method 2 (NL)

All vehicles of concern detected

Collateral damage: other vehicles also hit

Limitation could be fine tuned
Please keep in mind

1. Limit/result Ann.3 is basis Ann.10
2. Limitation Annex 3 is leading for stringency
3. Without it Annex 10 limits can’t be judged
4. Annex 10 has to be tuned to Annex 3 limits
5. Decisions should be made together
6. That’s the only correct way to deal with stringency
Stringency analysis

- See informal doc NL
- Will be presented by NL, mr de Graaff
Relation with present demands

Well known from GRB 50
Why two proposals?

• Started with FRA&GER&JAP proposal
• NL alternative: based on performance
• OICA came in with their proposal
• NL out because of measurement uncertainty
• GER withdraw support for their own proposal
• OICA left alone
Why two proposals? (2)

• OICA combined with non stringent limitation options
• Stringency issue was raised
• Reg 51-2 vs -3: only one point to compare → weakening: up to 10 dB
• No drive to work on this in the group
• NL felt obliged to come foreword with an alternative (formal)
Informal working group

Group divided

Support for method 1

Sympathy for method 2
What about a compromise? (1)

In Paris not possible: you need 2 to tango

Technical: compromises always possible:

• Method 1 could be made more stringent
• Method 2 could be made more lenient
• Additional demands
• Other approaches/concepts
What about a compromise? (2)

Proposal KBA (*TAA of Germany*)

Additional anchor point in method 1 (OICA)
Pulls limit line down $\rightarrow$ 10 of 13 VofC detected

So it’s a serious alternative to consider
Example KBA proposal (veh 200-14)

OICA worst case limit without KBA: Room to increase at R51.02: 10 dB(A)

OICA with KBA: Vehicle has to be improved
Compromise? → skip 2 m/ss (4)

Formal NL-proposal
Forces Annex 3 test to lower gear/higher revs
Result: anchorpoint ASEP to the middle
Effect on method 1 (OICA)
No effect on method 2 (NL)

By the way: no justification ever given
Compromise: (5)
Options with the methods

1. Method 1 (developed by OICA)
2. Method 1 + KBA repair
3. Method 1 + skip 2 m/ss
4. Method 1 + KBA + 2 m/ss
5. Method 2 (NL)
Alternatives out of the concept

(concept = line in engine map: L vs N)

Skip 2 m/ss + KBA
  – (as single point, without ASEP range)

Analyses tool mr Moore
  – (based on v,a instead of n)
Stringency of compromises: to be investigated

<table>
<thead>
<tr>
<th>Method</th>
<th>% vehicles of concern detected</th>
</tr>
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<tbody>
<tr>
<td>OICA + Jap limit</td>
<td>1 out of 14</td>
</tr>
<tr>
<td>OICA + more stringent limit</td>
<td>&gt;1</td>
</tr>
<tr>
<td>OICA + skip 2 m/ss</td>
<td></td>
</tr>
<tr>
<td>OICA + KBA</td>
<td></td>
</tr>
<tr>
<td>OICA + KBA + skip 2 m/ss</td>
<td>???</td>
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<tr>
<td>KBA + 2 m/ss</td>
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<tr>
<td>Analysis tool mr Moore</td>
<td>&lt;14</td>
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<tr>
<td>NL 2 with less stringent limit</td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>14 out of 14</td>
</tr>
</tbody>
</table>
Compromise: and now?

Well: if you give us one more meeting

You get the analyses of the options:
• Which part engine map covered
• Stringency
• Effects on the database:
Do not forget

It isn't a cow bargain!

Interest of industry:
• Fulfilling customer demands
• Freedom for sound design

Interest of some contr. parties:
• Decency demand on a ‘decent’ level
• Prevent drop down of ‘sound design’
And remember:

- Where to draw the line: that’s all!
THANK YOU