

# ASEP IWG Report to GRB 65<sup>th</sup>

ASEP, from 2005 to 2019 :

- *Background informations*
- *Detailed elaborated work plan and timeline of future works*

# ASEP, the origin

“The sound emission of the vehicle under normal driving conditions different from the conditions of the type approval test in Annex 3 shall not differ considerably from what can be expected from the type approval test result”

# ASEP, background Information, 2005

- The GRB, in 2005, approved the adoption of the revised International Organization for Standardization (ISO) 362 test procedure (TRANS/WP.29/GRB/40) as the technical basis for future versions of Regulation No. 51 and Regulation No. 41 on vehicle noise.
- As a consequence of the change in technical testing methods, a number of contracting parties expressed concern regarding :
  - the change in vehicle engine speed (r.p.m.) used during the certification test.
  - the desire to prohibit “cheating”,
  - a desire to check for ‘nonlinear’ behaviour,
  - a desire for an additional, independent, set of noise emission stringency tests for the approval of motor vehicles.
- As a result of these concerns, GRB established (TRANS/WP.29/GRB/40) an informal group on Additional Sound Emission Provisions (ASEP) for the incorporation of additional specifications for Regulation No. 51

# ASEP, background Information, 2005-2010

- 19 meeting from November 2005 to December 2009
- At the September 2009 session of GRB, the Chairman of the informal group reported to GRB that a consensus recommendation to GRB on Regulation No. 51 ASEP was not possible
- At the February 2010 meeting, while there was no further progress on a single consensus proposal, there was, however, a strong opinion expressed by contracting parties and accredited NGOs that a prompt resolution of this issue was necessary
- In September 2010, a proposal to address the concerns expressed has been provided by GRB Chairman that reaches the goals set forth by GRB for the purpose of ASEP in a sufficient manner to provide a basis for agreement by GRB and subsequent adoption by WP.29.  
(ECE/TRANS/WP.29/GRB/2010/9)

*As with any compromise proposal, no one will be completely satisfied, but each expressed policy goal of GRB can be shown to have been satisfied*

# ASEP, background Information, 2015-2016

Within the working group for future work for GRB 62, 63 and 64th session, several concerns about ASEP have been presented :

- Update the text to improve clarity and simplification in short term
- Add missing sound limit values for N1 and Off-road in Annex7 para. 5.3 to be added.
- Series hybrid vehicles are excluded from the ASEP until 30 June 2019; new test methods will be necessary in R51.
- ASEP as a part of type approval (not as a manufacturer declaration)
- More general technical review in cooperation with ISO (Improvement of methods)
- It was proposed to create an IWG for ASEP starting on 2016.

# ASEP, background Information, 2015-2016

- The expert from France presented the results of a survey on additional sound emission provisions (ASEP) (GRB-64-16). According the expert, the survey had identified a lot of issues in the application of ASEP of the 03 series of amendments to Regulation No. 51 and the need for further work on this subject. He further reported that this view was also shared by ISO, which proposed to revise the ASEP provisions (GRB-64-04).
- To make progress in this area, GRB decided, subject to WP.29 consent, to establish an IWG on ASEP and adopted its Terms of Reference (ToR) (GRB-64-23 and Rev.1).
- The aim of the group is to propose improvement of this regulation.

# ASEP, future works , 2016-2017

## TOR 2016

For primary objective of IWG for ASEP shall :

- On a short term :
  - continue work done by ISO to update the text to improve clarity and simplification;
  - propose missing limits for e.g. N1 from UN R51.02 in reference sound assessment;
  - re-structure the text or better understanding
- The aim of IWG is to present
  - a working document for consideration during the 65th GRB in February 2017 for clarification on ASEP
  - a detailed elaborated work plan and timeline

# ASEP, future works , 2016-2019

## TOR 2016

- Objective of IWG on mid/long term
  - review and improve test procedure for automatic transmission in non-locked Transmission condition;
  - propose a test procedures for hybrid vehicles and new technologies of vehicle.
  - propose a simplified test procedure and/or alternative test (such as indoor testing) to save time and to enable direct application of ASEP during type approval
- The group will present a progress report including already achieved further results by September 2018 and a comprehensive proposal by September 2019



# ASEP, future works , 2016-2019

## TOR 2016

- In addition, the IWG for ASEP might also propose a general principle for revision of ASEP regarding :
  - Consideration of scope and target to elaborate on sound behaviours subject to criticism;
  - Improve the effectiveness of the method regarding off-cycle tests, ...)
  - Field of application
  - Control range (method to be more representative for urban driving behavior)
  - Consider harmonization with ASEP UN R41 - if possible

# Current situation

## *Slope-Assement*

Strengths	Weaknesses
Prevents excessively loud noise emission in the ASEP control range.	Limits designed with assumption sound emission is correlated to throttle – does not account for loud partial throttle situations
Identifies and prohibits “test detection” strategies used in R51.02	Not all gears are in the scope of ASEP
Easily understood RPM vs. sound limits	RPM based limits not applicable for all products.
	Require a lot of tests and time

# Current situation

## $L_{urban}$ -Assessment

Strengths	Weaknesses
Prevents excessively loud noise emission in the ASEP control range.	Not applicable for accelerations lower than urban
Identifies and prohibits “test detection” strategies used in R51.02	Simple speed compensation
Assessment is sensitive to actual measured acceleration – if you don’t make acceleration, but only make sound, you get a high result.	Assessment is sensitive to actual acceleration measured – acceleration measured may not be actual vehicle performance
Performance based and design neutral	
Applicable to vehicles with no combustion engine RPM.	Limitation concept more difficult to understand
	Require a lot of tests and time

# Current situation

## *Reference Sound Assessment*

- Reference Sound-Assessment was introduced to simulate regulation UN51.02 on vehicle approved on UN51.03.
- IWG for ASEP consider that this method
  - is not efficient to address current concern of ASEP
  - is not representative to UN51.02. Uncertainties necessary for simulation are bigger than the restrictions applied already by the other assessment methods.
- IWG for ASEP recommends to consider the deletion of Reference Sound Assessment after revision of ASEP.

# Considerations of IWG about Goals for ASEP

## **The primary consideration for ASEP :**

- UN R51.03 ASEP is already a big improvement compared to UN Regulation R51.02, but:
  - The UN Regulation R51.03 has just started; thus products approved according to R51.03 have not yet arrived to the market on a large scale.
  - Many manufacturers, and especially aftermarket, will use the old R51.02 approvals up to the maximum possible application date in 2022.

# Considerations of IWG about goals for ASEP

## **The primary consideration for ASEP :**

- In general, IWG for ASEP recommends to increase the effectiveness of Regulation R51 – ASEP by addressing real world concerns as perceived by public. This will support the trust from all involved parties
- IWG for ASEP recommends to address undesired effects when reducing limits in future phases of R51.03 (cycle detection, manipulation, aftermarket, ...)
- Increasing market penetration of electronically controlled technologies (soundbox, variable exhaust systems, ...) must carefully be watched and be reliably protected against manipulation

# Concerns and elaborated work plan and timeline

**Extreme driving behaviour (starting highest RPM, extreme acceleration, non compliant speed ) ?**

→ IWG for ASEP acknowledges that this concern is not subject to be solved by vehicle regulations.

→ IWG for ASEP recommends to not consider such extreme behaviour for ASEP while real driving happens at much lower performance.

# Concerns and elaborated work plan and timeline

**Manipulation, Aftermarket and maintenance (racing-silencer, dB-Eaters, additional control units, illegal flap system/steering, ...)**

- IWG for ASEP recommends to insert additional requirements comparable to UN-R41.04 point 6.5 in UN-R51
- IWG for ASEP recommends to consider controls and roadside checking when developing new methods.
- IWG for ASEP proposes to work on these concerns in a mid term perspective.



# Concerns and elaborated work plan and timeline

**UN non compliant (ASEP-Declaration non ok, deviation of vehicle to approval, ...)**

→ IWG for ASEP recommends to include ASEP as part of type approval testing

→ IWG for ASEP proposes to work on an more efficient way to include it in TA testing (complete tests by Technical Service (TS), minimum number of points by TS, simplified method, ...) in a short term

# Concerns and elaborated work plan and timeline

**Vehicle extremely loud outside ASEP-Range/gear and grey areas of the regulation (racing mode, Use of dB-Eater, ...)**

- IWG for ASEP proposes to consider the extension of ASEP-range (<20 km/h, > 80 km/h, > nBB\_ASEP, all gears ...) during revision of ASEP
- IWG proposes to consider new concepts when defining future control range (e.g.  $v^*a$  concept, ...)
- IWG for ASEP proposes to consider impact on available test facilities to perform testing exceeding the current control range
- IWG proposes to work on this concern in a short term

# Concerns and elaborated work plan and timeline

## **Weakness of current ASEP methods :**

- IWG recommends to consider only one test procedure instead of three for mandatory application
- IWG proposes to work on short term on a new concept based on :
  - strenghts and weaknesses of current methods
  - real driving performance
  - technological neutrality  
(automatic transmission, hybrid vehicle, ...)
  - Criteria given for the determination of the term “vehicle of concern” (e.g. evidence of cycle beating and/or cycle detection, unexpected vehicle noise behaviour based on the individual vehicle’s technical capability, ...)

# Concerns and elaborated work plan and timeline

## **Weakness of current ASEP methods :**

- IWG proposes improvement of current methods taking into consideration new concepts :
  - $v^*a$  concept
  - Real Driving Noise (RDN)
  - Partial throttle, cruise, ...
- IWG for ASEP proposes to work on simplified test procedure and/or alternative test (such as in-door testing) to save time and to enable direct application of ASEP during type approval

# Concerns and elaborated work plan and timeline

- IWG for ASEP
  - will present a progress report each GRB session
  - will propose, as appropriate, to update the text to improve clarity and simplification each GRB session
  - will develop project plan incl. milestones for Q2 2017
  - targets a comprehensive final report by September 2019.
  - proposes to consult with ISO as appropriate
  - proposes to hold Task Force meetings with limited number of participants as appropriate

# Concerns and elaborated work plan and timeline

- IWG for ASEP proposes four meetings per year
- Upcoming meetings
  - May 10<sup>th</sup> morning to 12<sup>th</sup> noon, Brussels  
(Scope, review of new concept, continued discussion on pros and cons of existing methods, project plan)
  - July , 1<sup>st</sup> half, J or US, possibly combined with QRTV GTR meeting
  - November, 2<sup>nd</sup> week, US or J