Transmitted by the experts of IWG ASEP

Informal document **GRB-66-14**
(66th GRB, 4-6 September 2017,
agenda item 4 (b))

ASEP-04-09 Rev.1

ASEP IWG
Report to GRB 66th

Meetings

- 1rst Meeting : 2016, November – Tianjiin
- 2d Meeting : 2017, February – Geneva
- 3rd Meeting : 2017, May – Brussels
- 4th Meeting : 2017, July – Washington

Participants

- Contracting parties : France, China, Japan, Germany, EC, Spain
- NGOs : OICA, IMMA, CLEPA, ISO

Related documents

- **GRB 64th :**
  - GRB-64-23-(Rev.1) - (Chair) (Revised) draft Terms of Reference of IWG ASEP
  - GRB-64-16 - (France) Information on ASEP
  - GRB-64-04 - (ISO) Proposals to clarify the provisions of Regulation No. 51, Revision 3, Annex 7
- **GRB 65th :**
  - **ECE/TRANS/WP.29/GRB/2017/2 -** (IWG on ASEP) Proposal for Supplement 2 to the 03 series of amendments to Regulation No. 51
  - GRB-65-26 (IWG ASEP) - Modifications proposed to ECE/TRANS/WP.29/GRB/2017/2
  - GRB-65-25 (IWG ASEP) - Presentation of ECE/TRANS/WP.29/GRB/2017/2
  - GRB-65-24 (IWG ASEP) - Progress report
- **GRB 66th :**
  - **ECE/TRANS/WP.29/GRB/2017/5 -** (IWG on ASEP) Proposal for Supplement 3 to the 03 series of amendments to Regulation No. 51

And all documents in IWG website

Current procedures

- Principle to include any improvement (as possible) in current Annex 7 as soon as possible then to come to a general approach
- Proposal to include concerns of IWG (**ECE/TRANS/WP.29/GRB/2017/5)** :
  - Additional sentence in the scope to reflect the driving situations covered by ASEP
  - For some case, anchor point in i+1 (to avoid strong variation of vehicle noise in gear i).
  - Extend SPL measurement to line BB' + 20m to avoid "backfire”
  - Additional sentence to include all electric sound enhancement system (such as AVAS, silencers equipped with active cancelled system, …) during the test.

Revision strategies of IWG for ASEP

The revision of Annex 7 :

- should address environmentally relevant situation.
- should cover typical on-road operation until driving conditions with extreme accelerations in an extended speed range representative for urban and suburban traffic.
- should allow to check a wide variety of operating conditions : from cruise to full acceleration, from low speed to legal suburban traffic speed.
- shall not replace Annex 3 stringency.
- should permit to check the acoustic response of the vehicle to acceleration (higher acceleration, higher SPL / lower accelation, lower SPL).
- should permit to extrapolate the physical behaviour of the vehicle sound from annex 3 type approval test results.
- shall be applicable by UN R59 to replacement equipment.

Revision strategies of IWG for ASEP

- ASEP should have one single assessment method.
- ASEP shall be applicable to all vehicles but evaluation should be graduated from “no doubt” vehicle, “normal” vehicle, high powered vehicle and vehicle equipped with variable geometries and active sound systems.
- Annex 7 should be simplified as possible for workload and analysis.

Revision strategies of IWG for ASEP Control range

- Control range should be representative for the driving conditions as outlined in the scope :
- Control range under review :
  - **Speed :** < 20 km/h , > 80 km/h (to 100 km/h ?)
  - **Engine speed :** > n_{BB_ASEP} (max 90% of S)
  - **Gear :** All gears (bigger gear ratio range)
  - **Load :** From cruising to partial load
  - **Acceleration**
- Control range could be extend but limited practically by methods and facilities available

Revision strategies of IWG for ASEP Limit concept

- The limit concept should be defined by a « Full » vehicle noise model :
- $L_{model}(v, N, a) = L_{tyre}(v)$ « + » $L_{PowerTrain}(N, a)$

  with $L_{PowerTrain}$ ranges from L_{crs} to L_{wot}
- $L_{asep}(v, N, a) \leq L_{model}(v, N, a) + Margin$
- After model is established, limits (margins) shall be defined.

V : Speed ; N : Engine Speed ; a : Acceleration

Revision strategies of IWG for ASEP Test methods

- Tests methods shall be developed for :
  - Partial throttle,
  - Higher speed than 80 km/h and lower speed than 20km/h,
  - Indoor alternative.
- Tests methods shall be developed for all vehicle designs with focus on AT, HV, …

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Revision strategies of IWG for ASEP Tests and analysis to be done

- The test program was decided to :
  - create a data pool which can be used to investigate the impact of the ASEP revision on current vehicle technology
  - deliver data to support the validation of design parameter for the ASEP assessment model
- For the design of the model, normal products will be analysed with regard to typical sound variation.
- The group requests GRB members to deliver data for the next meeting. At least 2 data sets :
  - One on locked gear condition and
  - a second on non-locked gear conditions or HEV or any new technology vehicle.

See test programm GRB-ASEP-04-05 rev 1

See data entry sheet GRB-ASEP-04-06 rev 1

Project plan including milestones 2017-2018

- Up to Mid 2018: Collection of test data
  - Create a database of vehicles as a work tool to check the new ASEP concept
  - Generate additional data for the creation of a sound prediction model
- By Mid 2018: Finalize the develop a new ASEP test
- From Mid 2018: Make the first draft Regulation text

Project plan including milestones 2017-2018 Next meetings

- 5th Meeting : Japan, 2017, November, 7th am to 9th pm
- 6th Meeting : Geneva (in junction with GRB), 2018, January, 22th pm to 24th am
- 7th Meeting : China, 2018, April, 2d week ()
- 8th Meeting : Europe, 2018, July, 2d week ()
- 9th Meeting : Geneva (in junction with GRB), 2018, September, 10th pm to 12th am
- 10th Meeting : Japan, 2018, November, 1rst week ()

Project plan including milestones 2018-2020

What	When	Where to be discussed
Tests to be performed Database completed	Mid-2018	GRB IWG ASEP
Model concept analysis	2019-2020	IWG ASEP
Test methods	2018-2020	IWG ASEP with ISO support
Validation of tests methods, model, …	2019	GRB IWG ASEP
In general application of ASEP, administrative consideration, categories exemption, boundary conditions, amount of required evaluation, …	2019	GRB IWG ASEP (with TF or sub-group)

Project plan including milestones 2020

- The IWG for ASEP will provide a proposal for a revision of UN R51 and a final report to GRB.