

Introduction to the Principles of the ASEP Test as Developed by the IG-ASEP

for the 50th GRB Sep. 2009

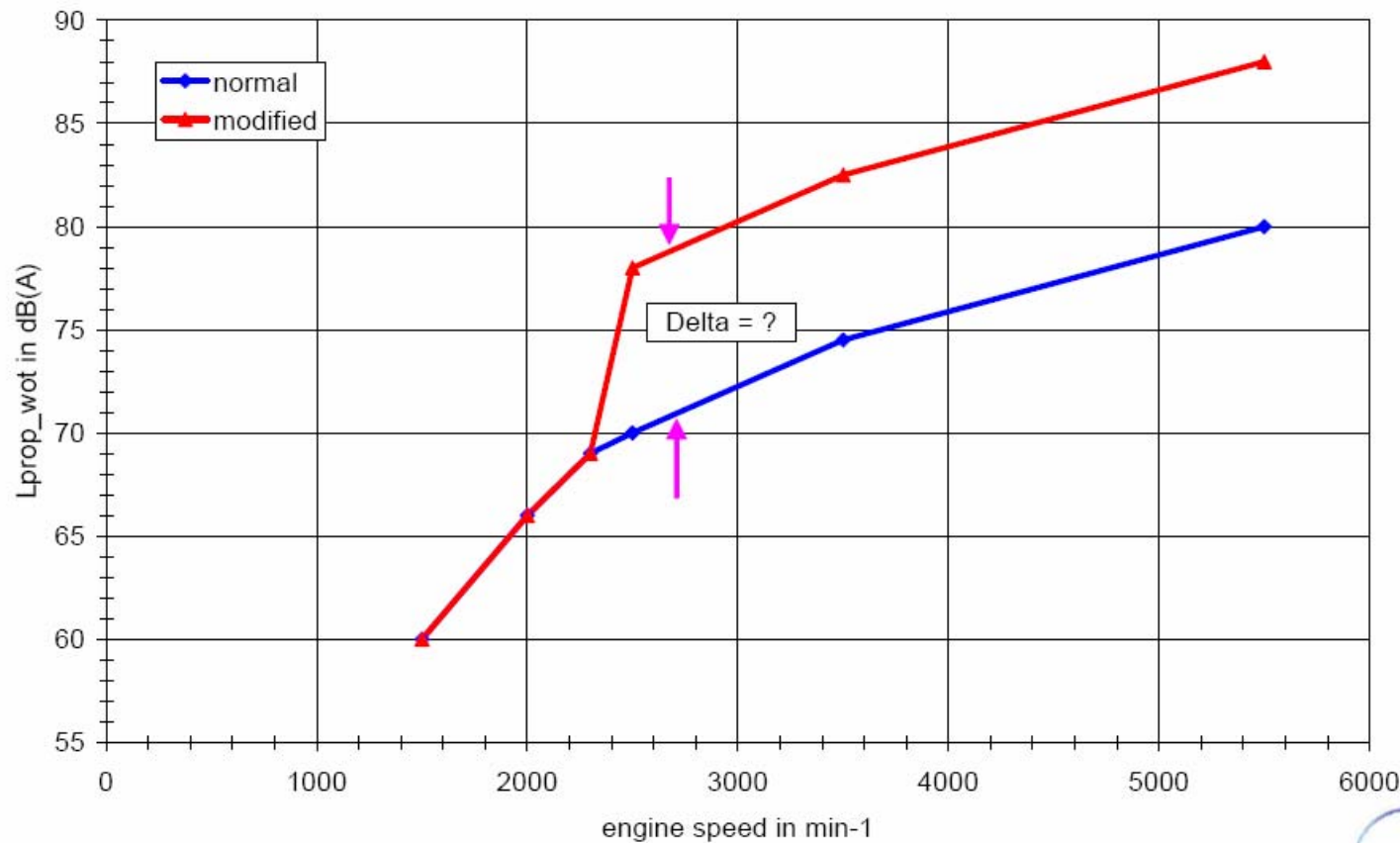
Work of the GRB Informal Group ASEP

- **Given scope by GRB as amended in TRANS/WP.29/GRB/2005/2/Rev.2:**
 - The additional sound emission provisions are preventive requirements.
 - The purpose of these requirements is to ensure that the sound emission of the vehicle under typical driving conditions different from the conditions of the type approval test in Annex 3 shall not deviate considerably from what can be expected from the Annex 3 test result for this specific vehicle.

- **Task for GRB Informal Group ASEP:**
 - Make a proposal for test boundary conditions that reflect other relevant driving conditions that are not covered by Annex 3.
 - Find a definition for what can be the expected sound emission of a vehicle.
 - Create an ASEP test, which is
 - Applicable to all vehicle designs
 - Repeatable
 - Acceptable with respect to workload and precision

Basics for ASEP as Discussed in GRB Inf. Grp Annex 3 in 2003

Off Cycle Emission Provisions



Application of ASEP

- **Applicable for all M1 and N1 equipped with an internal combustion engine.**
Thus all electrical vehicles are excluded.

- **Treatment of Hybrids:**

- Vehicles with a hybrid drive train which have an internal combustion engine with no mechanical coupling to the power train are excluded from ASEP.
Reason: The IC engine is only used for charging the battery. The driver has no control over the IC engine.
- Decision during 50th GRB: Above definition is accepted, by exemption is limited for a period of 5 years.
- UN-ECE may come forward with a better classification of hybrid vehicles.

- **Treatment of N1 vehicles:**

- Vehicles for good delivery are not in the focus of ASEP.

Note: OICA may wish to come forward with a specification for N1 vehicles that are solely made for good delivery.

Application of ASEP

- **For Type Approval:**

- Statement of compliance is required.
- Test is not mandatory.
- According to the 58-Agreement, the type approval authority has always the possibility to carry out the ASEP test.

- **For Conformity of Production (COP):**

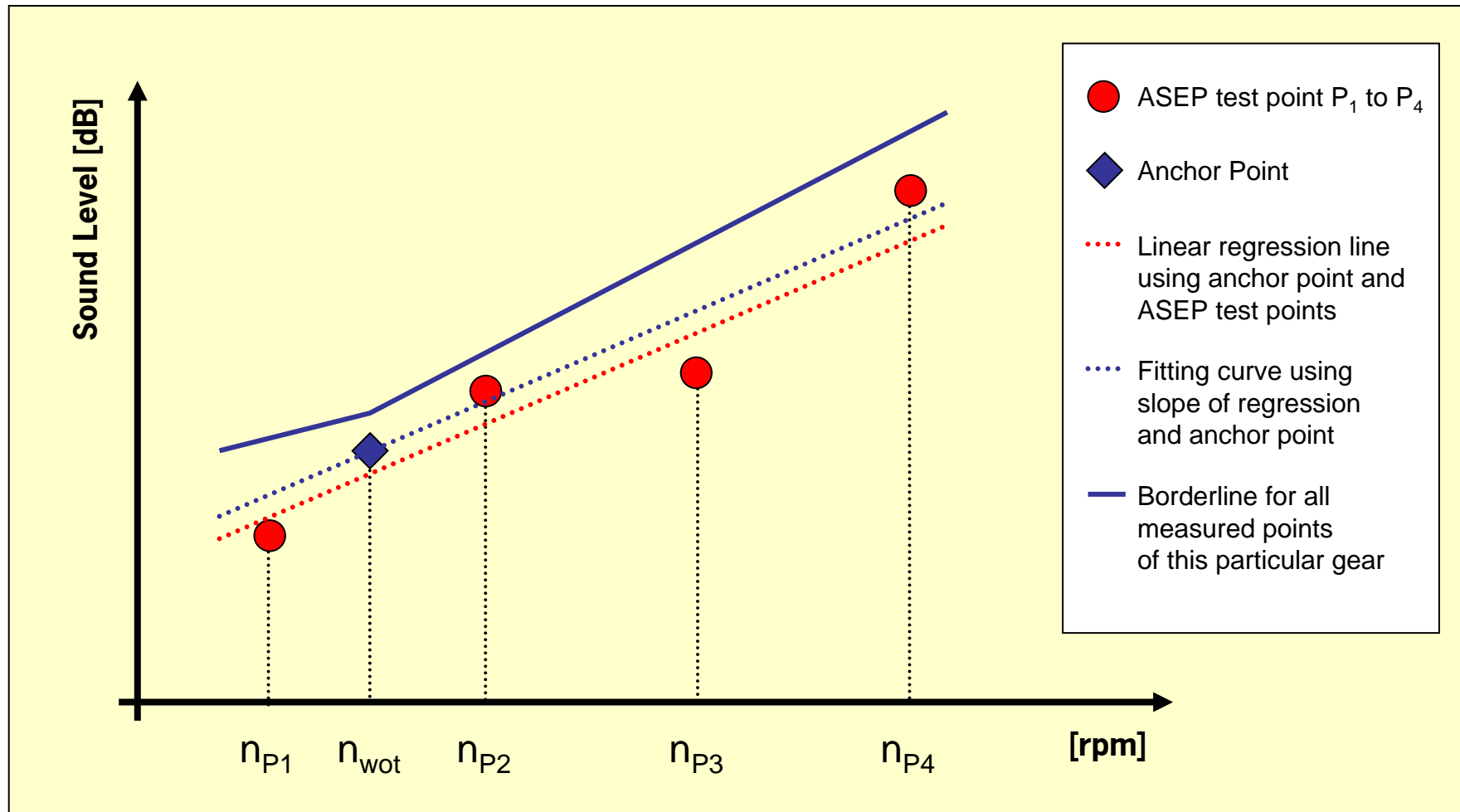
- For the **internal production control process**, the manufacturer shall assess the compliance with ASEP by an adequate engineering method.
- For **official COP checks** performed by the type approval authority the ASEP test can be requested, according to the 58-Agreement.

Philosophy of the Proposed ASEP Test

- The focus of ASEP is on the power train and not on tyres.
- Starting from the type approval test results of Annex 3, it is considered that the sound increase is a linear function over the engine speed.
- From the statistical use of vehicles in traffic it is known that very low engine speeds and very high engine speeds are much less frequently used than the engine speeds in the area of the Annex 3 type approval test.
- ASEP covers that area of the vehicle driving map as defined by the ASEP boundary conditions.

How to Check ASEP in a Particular Gear

Step 5: Apply the borderline by using a general margin and the „edging“. ASEP compliance is given, when all points are below the borderline.



ASEP Boundaries Which Define the Control Range of ASEP

(Decision by GRB Informal Group During its 15th Meeting in Flensburg)

■ Engine speed

- Maximum engine speed in test is derived from statistical investigations about aggressive driving on urban and suburban roads
- $n_{\max,ASEP} = 2,0 * PMR^{-0,222} * S$

■ Vehicles speed

- range from minimum entry speed of 20 km/h to maximum exit speed of 70 km/h.
- Maximum exit speed is extended to 80 km/h if foresaid engine speed is not reached in a gear.

■ Acceleration

- To ensure drivability and repeatability of measurements on the test track, maximum acceleration is set to 4.0 m/s².

■ Gear selection

- All gears up to the highest gears as measured in Annex 3.
- Not 1st gear and not reverse gear.

■ Vehicles setup modes

- If the vehicle is equipped with selector switches, like „Eco“ or „Sport“.
- All modes must comply with ASEP requirements.