

R51 ASEP measurement method (status after the 4th meeting)

Translation of the measurement protocol in to text
On the basis of TRANS/WP.29/GRB/2005/2/Rev.2
Distributed as an interim paper after the 4th meeting
In order to facilitate the measurements before the 5th meeting
Issued by the Netherlands
d.d. 14-9-2006

Annex 10

ADDITIONAL SOUND EMISSION PROVISIONS applicable for M1 and N1 only

1. General

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2. Requirement

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3. Measuring method

3.1 Measuring instruments and condition of measurements

Unless specified differently here after, the measuring instruments, the conditions of the measurements and the condition of the vehicle are equal to those specified in Annex 3 paragraph 1 and 2.

Some vehicles may have different software programs or modes which affect the acceleration behavior of the vehicle. Such programmes may include, but are not limited to, the transmission (e.g. sporty, winter, adaptive, etc.), the electronic stability program (on/off) and the intelligent cruise control (on/off). If the vehicle has different modes leading to valid accelerations, all these modes shall be in compliance with the requirements in this annex.

3.2. Method of testing.

Unless specified differently here after, the conditions and procedures of Annex 3 paragraph 3.1 until 3.1.2.1.2.2. have to be used.

3.3 Target conditions and boundary conditions

There is not a single target condition for the measurements. There is a range of valid operation conditions which have to fall within the following boundary conditions:

Vehicle speed:	$20 \leq V_{bb} \leq 80 \text{ km/h}$
Vehicle acceleration:	$a_{wot} \leq 3.5 \text{ m/s}^2$
Engine speed:	$n_{BB} \leq 2.6 * PMR^{-0.29} * (s - n_{idle}) + n_{idle}$
and:	$n_{BB} \leq 0.9 * (s - n_{idle}) + n_{idle}$

3.4. Gear ratio selection

The selection of gear ratios for the test depends on their specific acceleration potential a_{wot} under full throttle condition. All gear ratios leading to a valid operation condition within the boundary condition as specified in 3.3. can be used for the test. Some vehicles may have different software programs or modes for the transmission. In that case the demands of paragraph 3.1 apply.

In case of automatic gear boxes (including adaptive transmissions and CVT's) the test may include a gear change to a lower range and a higher acceleration. A gear change to a higher range and a lower acceleration is not allowed. A gear shifting to a gear ratio which leads to an acceleration higher than the boundary condition shall be avoided. In that case, it is permitted to establish and use electronic or mechanical devices, including alternate gear selector positions, to prevent a downshift to a gear ratio which leads to an acceleration higher than the boundary condition.

3.5. Acceleration test

Pre-acceleration before line AA' may be used to adjust the gear setting of automatic gear boxes and to achieve a more stable acceleration between line AA' and BB'. At the latest at line AA' the accelerator shall be fully depressed (as rapidly as is practicable). The accelerator shall be kept in this depressed condition until the rear of the vehicle reaches line BB'. The accelerator shall then be released as rapidly as possible.

The maximum A-weighted sound pressure level indicated during each passage of the vehicle between the two lines AA' and BB' (see Annex 8, Figure 1) shall be measured and noted, mathematically rounded to the first decimal place. If a sound peak obviously out of character with the general sound pressure level is observed, the measurement shall be discarded. Left and right side may be measured simultaneously or sequentially. The results of each side shall be evaluated separately.

The vehicle speed measurements at AA', BB', and PP' shall be noted and used in calculations to the first significant digit after the decimal place.

The engine speed measurements at AA', BB', and PP' shall be noted and used in calculations to the first significant digit before the decimal place.

The calculated acceleration $a_{wot\ test}$ shall be noted to the second digit after the decimal place.

At least eight valid measurements shall be carried out. At least four of them shall have an engine speed n_{BB} which is higher than the highest engine speed as tested in Annex 3 (n_{BB} in gear i). the measurements shall be equally distributed over the range of valid operation conditions.

3.6. Coast by test

The maximum sound level expressed in A-weighted decibels (dB(A)) shall be measured to the first decimal place as the vehicle is coasting between lines AA' and BB' (see Annex 8, Figure 1- front end of the vehicle on line AA', rear end of the vehicle on line BB'). This value will constitute the result of the measurement.

At least two measurements shall be made on each side of the test vehicle at test speeds lower than the reference speed of 50 km/h. and at least two measurements at test speeds higher than the reference speed of 50 km/h. The speeds shall be approximately equally spaced over the speed range between 30 and 70km/h.

The vehicle speed measurements at PP' shall be noted and used in calculations to the first significant digit after the decimal place.

4. Analysis and Interpretation of results

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5. Noise limitation curve

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