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Regulation No. 51
(Noise of M and N categories of vehicles)

Development

Proposal for draft amendment to Regulation No. 51

Transmitted by the expert from the European Association of Automotive Suppliers (CLEPA)

The text reproduced below was prepared by the expert from CLEPA to amend the title of Annex 5 to Regulation No. 51 in order to address exhaust systems containing absorbing materials, instead of fibrous ones and to update its paragraph 1. In conjunction with current terminology, references should be amended to clarify the road efficiency concept and to clarify the absorbing material specification and compliance characteristics. The modifications to the current text of the Regulation are marked in **bold** characters.

A. PROPOSAL

Annex 5,

The title, amend to read:

"EXHAUST SYSTEMS CONTAINING **ABSORBING** MATERIALS"

Paragraph 1., amend to read:

- "1. **When absorbing** materials **are** used in the construction of silencers suitable measures **shall be** undertaken at the design or production stages to ensure that the efficiency required to comply with the limits imposed in paragraph 6.2.2. of this Regulation is achieved on the road.

Such a silencer shall be considered to be efficient on the road

- (a) if the exhaust gases are not in contact with the fibrous materials, or
- (b) if the silencer of the prototype vehicle tested in accordance with the requirements of paragraphs 3.1. and 3.2. of **Annex 3** to this Regulation has been put into a normal state for road use before the sound-level measurements are taken, or
- (c) **if it is approved that the absorbing material as used in the silencer(s) of the vehicle presented for type approval is not subject to deterioration in terms of its sound absorbing function.**

This can be achieved by using one of the three tests described in paragraphs 2., 3. and 4. below or by removing the fibrous materials from the silencer.

In the case of option (c), a comparison test in accordance with the requirements of paragraphs 3.1. and 3.2. of Annex 3 to this Regulation before and after the conditioning according to paragraphs 2., 3. or 4. of this annex shall be carried out. The result of the comparison shall be valid for generic interpretation. In the case where the result shows that the absorbing material is not subject to deterioration in terms of its sound absorbing function, the result may be used for other silencers being equipped with absorbing material of the same specification.

Absorbing materials are considered to be of the same specification if complying with the following characteristics:

- (a) Type of the material (e.g. basalt wool, biosil wool, glass wool, E-type wool, etc),
- (b) **Binder material specifications (if applicable),**
- (c) **Average fiber dimensions (thickness, length),**
- (d) Average bulk material packing density (kg/m³).

B. JUSTIFICATION

Exhaust silencers may contain sound absorbing materials, also called fibrous materials.

Due to the specification of the material employed, the absorption effectiveness can deteriorate during normal driving use. In order to ensure that silencers with absorbing material used for type approval tests represent a status that is typical for normal use, these silencers should comply with certain conditions, mainly by mandatory preconditioning.

Currently applied material specifications are different from the ones applied in the past. Modern absorbing materials do not typically show deterioration in terms of sound absorption anymore. While the preconditioning of muffler systems with absorbing material requires manpower and the use of test facilities, these tests do not provide additional information.

It would therefore be appropriate to include in the requirements for the conditioning of silencers with absorbing material, the possibility to refrain from conditioning each individual silencer. Instead, a generic test, proving that a specific material is not subject to deterioration should be applicable. This finding can subsequently be transposed to other mufflers containing absorbing material of the same specification.

To implement the above mentioned, Annex 5 to Regulation No. 51 should be amended.
