

## **Prevention of in use degradation of noise properties of vehicles due to the fitting of replacement exhaust silencers**

### **1. Interaction between Regulation No. 59 and Regulation No. 51**

The noise emission of new vehicles is regulated with Regulation No. 51 (Uniform provisions concerning the approval of motor vehicles having at least four wheels with regard to their noise emissions). In order to prevent that this noise emission increases after the fitting of a replacement silencer, Regulation No. 59 (Uniform provisions concerning the approval of replacement silencing systems) sets demands to the noise emission of replacement silencers.

Currently there is a strong interaction between Regulation No. 59 and Regulation No. 51. Regulation No. 59 is so strong connected to Regulation No. 51, that it does not incorporate an own measurement method for noise. Therefore it refers to Regulation No. 51 twice:

1. with respect to the judgement of the sample vehicle (it should comply with the limit and be not more than 3 dB(A) louder than the type approved vehicle);
2. with respect to the assessment of the silencing system itself (it should be not louder than the original system as measured with the sample vehicle above).

In practice this means that a vehicle which is produced well below the limit, can be equipped with an aftermarket sport exhaust which is a little louder than the original exhaust. This is however very limited, because the vehicle with the sport exhaust should still fulfil the limit.

### **2. Measurement method for exhaust noise**

The measurement method of the current Regulation No. 51 has always been dedicated to determining the acoustical quality of exhaust systems. Therefore it measures at an operation condition where the exhaust noise will pronounce, if it is an important source: full throttle at relatively high RPM while minimising tyre/road noise (low noise test track and tyres).

For most normal vehicles exhaust noise has been greatly reduced now. Therefore GRB has introduced a new proposal for amendment of Regulation No. 51, which focuses less on exhaust systems and more on tyre/road noise. This proposal measures partial throttle at relatively low RPM with realistic tyres. This has various advances, but also means that this proposal is less capable of detecting differences in exhaust noise compared to the current Regulation No. 51. An example of this is shown in figure 1.

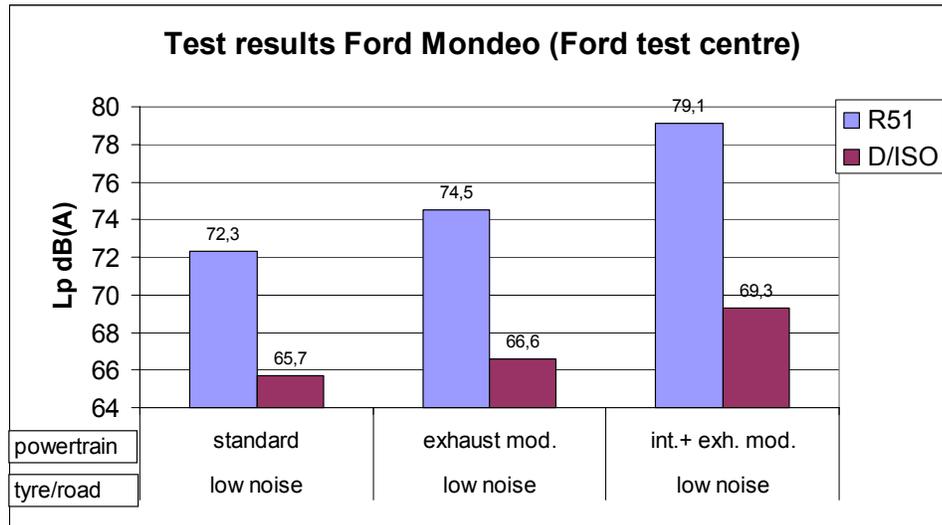


Fig 1. Test results with three variants of intake/exhaust configuration measured with the current Regulation No. 51 and the D/ISO proposal (status of February 2003). The 1<sup>st</sup> variant is the original vehicle; the 2<sup>nd</sup> has an approved sport exhaust; the 3<sup>rd</sup> has an unapproved modification.

In the current system of Regulation No. 51 and Regulation No. 59 the second variant is just on the limit of approval. The 3<sup>rd</sup> variant is clearly rejected by the current system.

Measured according to the new proposal, the differences between the intake/exhaust variants decrease. This confirms the intention of the method: to focus less on intake/exhaust and more on other sources of the vehicle. The approval and rejection of the three variants in the future system of course depends on the future limits. It is however clear that the margin between currently approved and currently rejected exhausts will decrease in the foreseen proposal.

### 3. Netherlands concerns

The Netherlands fears that an amendment of Regulation No. 51 as currently proposed in annex 3 by the GRB informal group may

1. weaken the relation between Regulation No. 51 and Regulation No. 59;
2. weaken the ability of Regulation No. 59 to detect noisy replacement silencers;
3. result in the approval and production of replacement silencers that are significantly louder than currently on the market;
4. have an adverse effect on the environmental noise emission and therefore undermine the original goal of the amendment.

### 4. Proposal by the Netherlands

The Netherlands would welcome a principal discussion in GRB, in order to

1. learn about the viewpoints of other delegations on this changing interaction between Regulation No. 51 and Regulation No. 59;
2. learn candidate solutions against this potential adverse effect of the Regulation No. 51 amendment.