

Original: RUSSIAN

Proposal for draft amendments to Regulation No. 51

(Durability provisions for vehicles concerning their noise)

Note: This proposal was prepared by the experts from Russian Federation following the invitation by GRB (ECE/TRANS/WP.29/GRB/41, para. 5).

A. INTRODUCTION

The deterioration of vehicle parameters related to its noise emissions can occur for several reasons:

- destruction of parts ensuring low noise level;
- occurrence of defects in a casing of parts ensuring low noise level with preservation of integrity of the design;
- occurrence of defects (deterioration of properties, reduction of volume of filling) of internal parts ensuring low noise level;
- increase of intensity of the sources of noise and vibration owing to wear process of the related parts.

Let us consider these reasons in detail.

Destruction of parts ensuring low noise level: silencers of the exhaust system, compressed air silencers, shielding parts of the powertrain, as a rule, results in so sharp increase of noise level, so that the further operation without repair becomes impossible. And, basically, it occurs at infringement of normal conditions of operation. Thus, in consideration of maintenance of vehicle parameters related to its noise emissions, this reason can be neglected.

The occurrence of defects in design results in increase of noise, but not so strong to lead to the termination of operation.

The reasons of occurrence of defects in design can include the following:

- burning-out of parts of the exhaust system of the engine because of high temperatures of exhaust gases;
- appearance of cracks because of sharp change of outside temperatures and influence of a moisture and aggressive road environment;
- appearance of micro-apertures because of corrosive attack;
- infringement of durability of welded connections because of their initial poor quality;
- aging of materials used in the parts reducing the structural noise of powertrain.

There is a possibility to predict either preservation or deterioration of properties of the system of reduction of noise of a vehicle due to afore stated reasons. Nevertheless, founding of a correlation between the conditions of any accelerated tests and real operation in various conditions still requires a serious and long research, including such of separate constructional materials as well as parts at thermal and cyclic thermal loading, influence of an aggressive environment and force application. It is rather difficult to examine the design as a whole.

B. OBJECTIVE OF THE PROPOSAL

The proposal is made with the purpose of achievement of real reduction of noise of vehicles in service.

The proposal is based on the approach applied in the ECE Regulation No. 83, where the decrease of the overall performance of the catalytic converters of in-service vehicles is taken into account.

The delegation of the Russian Federation proposes GRB to consider the approach, according to which it would be possible to regulate in the ECE Regulation No. 51 the maintenance of vehicle parameters related to its noise emissions. If GRB agrees with the proposed approach, the experts of the Russian Federation would be ready to continue work on preparation of the appropriate amendments to ECE Regulation No. 51.

C. PROPOSED AMENDMENTS

1. Paragraph 6.1.2., amend to read:

"6.1.2. The noise reduction system shall be so designed, constructed and assembled as to be able to reasonably resist the corrosion and aging phenomena and high temperatures to which it is exposed having regard to the conditions of use of the vehicle."

2. Insert a new paragraph 6.1.3., to read:

"6.1.3. The manufacturer shall apply such technical measures, which, in accordance with the Regulation, provide maintenance of vehicle parameters related to its noise emissions during usual service life of a vehicle under the regular operation conditions. The provisions of paragraph 6.1.3. are considered to be met, if the provisions of the paragraphs 6.3., 6.4. and 6.5. are fulfilled."

3. Add a new subparagraph to the paragraph 6.2.1.1., to read:

"For each of results of tests (noise of a vehicle in motion, noise of a vehicle when stationary, compressed air noise) the final results of tests are obtained taking into account the adjusting correction as determined in paragraph 6.5. These results are compared to the sound level limits stipulated in paragraph 6.2.2."

4. Insert new paragraphs 6.4. and 6.4.1., to read:

"6.4. Specifications regarding noise reduction systems of compressed air venting at operation of pneumatic braking system.

6.4.1. Requirements of Annex 6 shall be applied."

5. Insert new paragraphs 6.5., 6.5.1. and 6.5.2., to read:

"6.5. Check of maintenance of vehicle parameters related to its noise emissions.

6.5.1. Such check is carried out for all vehicle types. The vehicle test drive with the total mileage of [80,000] km can include driving on the test track, public roads, and dynamometric test bench. Approximately half of the test drive simulates motion in urban conditions and the rest part of the test drive simulates motion with high speed.

The Technical Service carries out the noise measurement before completion of the test drive, and calculates the test results to be brought into the official communication, taking into account the adjusting correction. In this case, the adjusting correction is defined as the difference of the results of noise measurement at the beginning and at the end of the test drive.

6.5.2. In deviation from the provisions of the paragraph 6.5.1., the manufacturer can choose for use the adjusting corrections, as provided in the table below, as an alternative to the realization of the test drive.

Methods of measurement	Vehicle categories	Adjusting corrections, dB (A)
Noise of a vehicle in motion	[M,N]	[1-2]
Noise of a vehicle when stationary	[M,N]	[3-5]
Compressed air noise	[M,N]	[2-3]

Annex 6, insert a new paragraph 4., to read:

"4. Specifications regarding noise reduction systems of compressed air venting at operation of pneumatic braking system.

The noise reduction systems of compressed air venting at operation of pneumatic braking system shall be prepared for the tests by operation of not less than [1,000] times of the device, on which the noise silencers are installed, before measurements of the sound level. The device shall operate at the pressure of not less than [80 per cent] from the nominal level."
