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**ECONOMIC COMMISSION FOR EUROPE**

INLAND TRANSPORT COMMITTEE

Working Party on the Construction of Vehicles

Meeting of Experts on Noise

**REPORT OF THE MEETING OF EXPERTS ON NOISE  
ON ITS TWENTY-SIXTH SESSION**

(24 to 27 February 1997)

1. The Meeting of Experts on Noise held its twenty-sixth session from 24 February (afternoon) to 26 February 1997 only under the chairmanship of Mr. H. Löffelholz (Germany). Experts from the following countries participated in the work: Czech Republic; France; Germany; Hungary; Italy; Netherlands; Poland; Russian Federation; Slovakia; Spain; Switzerland; United Kingdom; United States of America. Representatives of Japan took part in the session under paragraph 11 of the Commission's Terms of Reference. An expert from the International Road Traffic Organization (IRTO) participated. Experts from the following non-governmental organizations took part in the session: International Organization for Standardization (ISO); International Organization of Motor Vehicle Manufacturers (OICA); International Motorcycle Manufacturers Association (IMMA); International Road Federation (IRF); European Tyre and Rim Technical Organization (ETRTO).

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The distribution of documents of the Inland Transport Committee and its subsidiary bodies is limited. They are distributed only to governments, to specialized agencies and to governmental and non-governmental organizations which take part in the work of the Committee and of its subsidiary bodies, and should not be given to newspapers or periodicals.

2. The documents without a symbol distributed during the session are listed in the annex to this report.

#### TYRE-ROAD NOISE LIMITATION

(a) Regulation No. 30 (Pneumatic tyres)

Documentation: TRANS/WP.29/GRB/R.140; TRANS/WP.29/GRB/R.144; informal documents Nos. 7, 8 and 9 of the annex to this report.

3. The expert from Germany introduced documents TRANS/WP.29/GRB/R.140 and TRANS/WP.29/R.141 (see para. 15 below) containing the proposals incorporating tyre-road noise provisions into Regulations Nos. 30 and 54.

4. He recalled that the proposals had been based on the coast-by measuring method using the ISO 10844:1994 test track, as proposed earlier by France (TRANS/WP.29/GRB/R.129) and that they had regarded the suggestions by ETRTO and the Nordic Countries, submitted also to the European Commission's ERGA-Noise III group. He indicated that implementation of these proposals was expected to remove approximately 25 per cent of the noisiest tyres existing on the present market. He mentioned the noise limits and the categorization of tyres for Regulation No. 30 tyres into two tread construction categories with the noise limits specified according to the load capacity index range. (For Regulation No. 54 tyres see para. 15 below).

5. As a counter proposal, the expert from ETRTO presented document TRANS/WP.29/GRB/R.144 containing a proposal for a separate draft Regulation concerning tyre-road noise limitation with the noise limits established on the basis of tyre width (instead of tyre load index as in the proposal by Germany mentioned in paragraph 4 above).

6. The expert from OICA contributed to the discussion by presenting a comparison between the proposals by Germany (TRANS/WP.29/GRB/R.140 and TRANS/WP.29/GRB/R.141), the draft European Commission proposal (III/5275/96-EN) and the proposal by ETRTO (TRANS/WP.29/GRB/R.144). He pointed out the differences between the limit values and methods of their assessment. He also expressed the opinion that a motor vehicle fitted with noise approved tyres would not automatically comply with the noise limits set in Regulation No. 51. He suggested that a two axle trailer should also be accepted as a test vehicle. He wished to have a technical demonstration proving that safety properties of the tyres would not be impaired by noise emission reductions (informal document No. 7).

7. The expert from the United Kingdom presented an assessment of the tyre noise type approval method that was considered by the Meeting of Experts and parallel to that considered in the EC. He presented the results of research carried out by the Transport Research Laboratory and recommended the Meeting of Experts to introduce a tyre-road noise test only in conjunction with an appropriate test method designed to ensure an adequate tyre adhesion and safety performance. He suggested that the proposed ISO test surface should not be used for tyre noise testing until further information about its representativeness was available and recommended that an additional reference surface be developed in order to provide a test condition that would be representative of operation on European high speed roads. He also expressed the opinion that tyres should be tested at two different speeds and suggested

that the higher test speeds should be increased to 110 km/h for car tyres and to 90 km/h for commercial vehicles. Other proposals of the report related to temperature correction, measurement conditions, and to the simplification of the test method.

8. The expert from the Russian Federation proposed to allow a minimum ambient temperature of 0 °C instead of 5 °C for tyre-road noise measurement. In this relation, the expert from ISO confirmed that in the ISO working group responsible for the revision of standard ISO 362:1981 a value of 0 °C had been supported.

9. The expert from the Netherlands pointed out the importance of the differences between testing surfaces which can affect the test results. He supported in principle the views expressed by the United Kingdom (see para. 7 above).

10. The experts from France and Germany appreciated the above-mentioned contributions. However, they said that in view of the already available results the ISO 10844:1994 test track surface should be used as a reference for tyre-road noise limitation.

11. The expert from ETRTO stated that tyre noise tests had been made on different test tracks equipped with an ISO 10844:1994 surface. However, the test results exhibited some unexpected differences. He was of the opinion that a further step would be necessary before setting the tyre noise procedure and expressed his disagreement with the noise limits considered by the Meeting of Experts (see paras. 3 and 4 above). He recalled his proposal for a separate tyre noise Regulation in order to make a clear distinction among the already approved tyres that, in his opinion, should not undergo the noise prescriptions and the new type of tyres to which the noise Regulation should be addressed (see para. 5 above).

12. The expert from the United States of America suggested that a step-by-step approach should be adopted by the Meeting of Experts in dealing with the subject. He proposed to deal firstly with the test track definition and with the test procedure and to discuss later the safety aspect as well as the noise limits and their assessment.

13. In order to resolve the differences in opinions, the Meeting of Experts agreed to set up two task groups aimed at studying (a) test methods and (b) test surfaces. It was agreed that the group responsible for studying test methods should be chaired by Dr. Lukaszewicz from Germany and the group responsible for studying the test surfaces by Mr. Van Blokland from the Netherlands. The Chairman of the Meeting of Experts agreed to propose to the Working Party on the Construction of Vehicles at its next session in March 1997 to approve the mandates to the above-mentioned groups. With respect to the future work of the Meeting of Experts, it was agreed that the aspects related to safety (tyre adhesion properties) should be studied in close cooperation with the Meeting of Experts on Brakes and Running Gear.

14. The Meeting of Experts agreed to consider in detail at its next session the proposals by Germany for amending Regulations Nos. 30 and 54 (see para. 15 below), taking into account the proposals by ETRTO as well as the proposals expected to be furnished by the task groups (see para. 13 above).

(b) Regulation No. 54 (Pneumatic tyres for commercial vehicles)

Documentation: TRANS/WP.29/GRB/R.141; TRANS/WP.29/GRB/R.144; informal documents Nos. 7, 8 and 9 of the annex to this report.

15. Consideration of this item was held in conjunction with the proposal related to tyre noise limitation of passenger cars, with the parallel conclusions (see paras. 3-14 above). In describing the basic philosophy of document TRANS/WP.29/GRB/R.141, the expert from Germany pointed out the separate consideration of tyres for light commercial vehicles and tyres for heavy commercial vehicles, with the limits specified in each group for three tread construction categories.

AMENDMENTS TO NOISE REGULATIONS RELATED TO TWO- AND THREE-WHEELED VEHICLES

(a) Regulation No. 9 (Noise of three-wheeled vehicles)

Documentation: TRANS/WP.29/GRB/R.119/Rev.1.

16. In the resumed consideration of the proposal, the expert from Spain informed the Meeting of Experts about the amendments recently agreed in the EC and suggested that they should be introduced in the proposal as soon as they were officially approved.

17. He mentioned in particular that it had been proposed in the EC that for L2 category vehicles the noise limit should be 76 dB(A) whilst for L4 and L5 categories it should be 80 dB(A). Other modifications mentioned related to the measurement method and the calculation of its results.

18. Responding to a question by the expert from the United States of America, the expert from IMMA expressed his opinion that a tyre-road noise test would not be necessary for three-wheeled vehicles because they represent a small percentage of the total fleet. The expert from ETRTO added that the average speed of these vehicles is very low (under 20 km/h) as they usually run in urban areas only.

19. The Meeting of Experts agreed that, until a final decision was taken in the EC, the proposal for amending Regulation No. 9 should not be further revised and that its consideration should be resumed at the next session, awaiting additional information from the EC.

(b) Regulation No. 63 (Noise of mopeds)

Documentation: TRANS/WP.29/GRB/R.121/Rev.1.

20. The expert from Spain informed the Meeting of Experts about the agreements reached in the EC and highlighted the changes to be introduced in his proposal in order to align it with the corresponding draft Directive.

21. Noting the parallel with the proposal for draft amendments to Regulation No. 9 (see paras. 16 to 19 above), the Meeting of Experts deferred consideration of this item to the next session, awaiting additional information from the EU.

(c) Regulation No. 92 (Replacement silencing systems for motorcycles)

Documentation: TRANS/WP.29/GRB/R.122/Rev.1; TRANS/WP.29/GRB/R.126/Rev.1.

22. Consideration of this item was deferred to the next session for the reasons identical with paragraphs 20 and 21 above.

23. The expert from France noted some editorial errors in the French version of document TRANS/WP.29/GRB/R.122/Rev.1 and agreed to communicate the corrections to the secretariat.

24. The expert from Germany gave a brief presentation showing the main differences existing between the proposal of the EU Directive and the ECE Regulations concerning the noise of two- and three-wheeled vehicles, particularly with respect to vehicle classes (maximum speed and engine capacity) and the relevant noise limits.

AMENDMENTS TO REGULATION No. 51 (Noise of M and N categories of vehicles)

Documentation: TRANS/WP.29/GRB/R.142, informal documents Nos. 1, 5, 10, 11 and 13 of the annex to this report.

25. At the request of the expert from the Russian Federation, the proposal for a draft Corrigendum to Regulation No. 51, Revision 1, referring largely to the Russian text (TRANS/WP.29/GRB/R.142), was withdrawn from consideration. He suggested that a more complete corrigenda to the Russian text would be provided to the secretariat in order to publish it (Russian only).

26. The expert from the Russian Federation introduced also informal document No. 1 aimed to re-introduce into the Regulation provisions necessary for testing of certain vehicles equipped with automatic transmissions. The Meeting of Experts agreed to consider the proposal in detail at its next session and requested the secretariat to distribute it with an official symbol.

27. The expert from ISO presented informal document No. 10 concerning the modification of the test method (ISO 362:1981) in order to improve its repeatability and reproducibility. He indicated that the major changes comprised the use of ISO 10844:1994 test track, change of the driving cycle, requirement of periodic instrumentation calibration and the possibility to allow reduced depth of the tyre in order to suppress the noise emitted by tyres. The draft revision of the standard, ISO/DIS 362, was distributed as informal document No. 11.

28. The expert from OICA presented results of a research concerning light vehicle exterior noise (informal document No. 13). The research had been carried out in order to evaluate the correlation between existing ISO test procedures and typical urban driving cycles and to determine the correlation of pass-by noise results from an indoor noise facility (USA procedure) with results obtained at outdoor noise test tracks. The main findings were that the current acceleration test method did not correlate well with urban driving conditions in terms of speed and acceleration rate for a particular gear; furthermore, the exterior pass-by noise was highly speed dependent and only mildly dependent on engine speed or acceleration. The use of shaved tyre tread (reduced tread depth) greatly reduced the difference between indoor and outdoor

pass-by sound levels.

29. The expert from Japan contributed to the discussion by presenting the results of an investigation made into urban driving modes in his country (informal document No. 5). He said that it should be possible to set a representative test condition for urban tests under acceleration by specifying the initial and terminal acceleration conditions in relation to the vehicle power/mass ratio.

30. The expert from Germany gave an interim report on the research project carried out in his country to provide a base for improvement of noise regulations for cars and commercial vehicles. The analysis of driving behaviour data of ten passenger cars and one off-road vehicle in urban driving conditions considered sixteen different types of road conditions. The sample of commercial vehicles included at least thirty different trucks, five buses and one coach. The results which had first been presented during the previous session revealed that the present full-load acceleration noise test of Regulation No. 51 did not correspond to real traffic situation. The German expert suggested that there were prospects to define a new test, more realistic whilst still reproducible. He showed the frequency distribution of speed, acceleration, engine power and gear usage for different street types and for different kinds of vehicles. He indicated that this analysis should allow to establish realistic operational modes for a new noise test method which would be submitted to the Meeting of Experts for consideration.

31. The discussion of the research work carried out on vehicle noise led to the conclusion that a modified test might allow noise limit reductions which would be perceived in real traffic conditions, contrary to the present worst case test used in Regulation No. 51. It was recalled that this type of test had caused only limited impact on the real traffic noise attenuation even though the noise limits had drastically been reduced during the last twenty-five years.

32. The Meeting of Experts agreed to resume the consideration of this item at its next session.

#### PREPARATION OF THE 1997 REGIONAL CONFERENCE ON TRANSPORT AND THE ENVIRONMENT

##### (a) Construction requirements on vehicles in international traffic

Documentation: TRANS/WP.29/R.748/Rev.1-TRANS/SC.1/WP.1/R.137/Rev.1; informal document No. 2 of the annex to this report.

33. The secretariat introduced informal document No. 2 concerning a proposal to amend the 1971 European Agreement supplementing the 1968 Vienna Convention. The aim of the proposal, which had been considered at the last session of the Preparatory Committee of the Regional Conference on Transport and the Environment, was to ensure that commercial vehicles in international traffic comply with harmonized technical requirements regarding their environmental performance. The proposal was noted and the Meeting of Experts agreed to review at its next session its development into a final document for the Conference.

##### (b) Periodic inspections of vehicles in international operations

Documentation: TRANS/WP.29/R.764/Rev.1-TRANS/SC.1/WP.1/R.138/Rev.1; informal documents Nos. 3 and 4 of the annex to this report.

34. The secretariat introduced informal document No. 3 concerning the proposal for an "Agreement Concerning the Adoption of Uniform Conditions for Periodical Technical Inspections of Wheeled Vehicles". The document which had been considered at the thirteenth session of the Preparatory Committee of the Regional Conference on Transport and the Environment contained the administrative part of the Agreement, having the structure parallel to the 1958 Agreement. Related informal document No. 4 contained provisions concerning the rules for periodical technical inspections of vehicles with regard to the protection of the environment. It was explained that future rules might comprise the safety aspects. The Meeting of Experts agreed to resume the consideration of this item at its next session in order to register its further development for the Conference.

#### DEFINITION OF TESTING PROVISIONS IN NOISE REGULATIONS

Documentation: TRANS/WP.29/GRB/R.125/Rev.2.

35. The expert from the Czech Republic introduced his proposal which had been prepared with the aim of harmonizing the requirements on measuring instruments, testing conditions and interpretation of results in all Regulations referring to noise of vehicles.

36. The Meeting of Experts agreed in principal with the proposal, although the section related to the interpretation of test results was found difficult to harmonize at the present time. In this relation, it was pointed out that the proposal prescribed that the highest sound level should constitute the test result while the draft EU Directive on two- and three-wheeled vehicles (to which the corresponding ECE Regulations needed to be aligned) required to take the average value (see paras. 16-24 above).

37. The Meeting of Experts agreed to resume consideration of this item at its next session awaiting the final decision concerning the two- and three-wheeled vehicle noise EU Directive.

EXCHANGE OF INFORMATION ON NATIONAL AND INTERNATIONAL  
REQUIREMENTS ON NOISE LEVEL

Documentation: Informal document No. 6 of the annex to this report.

38. The expert from Japan distributed informal document No. 6 and informed the Meeting of Experts that his Ministry of Transport had decided to revise the national legislation in order to reduce noise from motor vehicles. As from October 1998 noise limits would be more stringent for new vehicle models and a modified test method would be implemented.

OTHER BUSINESS

(a) Traffic noise modelling

Documentation: Informal document No. 12 of the annex to this report.

39. The expert from the United States of America presented a computer simulation regarding the application of a traffic noise model, which had been developed by the University of Central Florida. He also explained that the model had recently been further improved (Version 4.2) by adopting new traffic algorithms which allow a better simulation of the pass-by traffic noise. A contact address for further information regarding this model was distributed (Dr. Roger Wayson, Department of Civil & Environmental Engineering, University of Central Florida, P.O. Box 162450, Orlando FL 32816-2450, Fax: (+1-407) 823-3315).

AGENDA FOR THE NEXT SESSION

40. The following agenda was agreed for the twenty-seventh session (Geneva, 4 and 5 September 1997) 1/:

1. Tyre-road noise 2/
  - 1.1. Amendments to Regulation No. 30 (Pneumatic tyres)
  - 1.2. Amendments to Regulation No. 54 (Pneumatic tyres for commercial vehicles)

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1/ As part of the secretariat's efforts to reduce expenditure, all the official documents distributed prior to the session by mail will not be available in the conference room for distribution to session participants. Delegates are kindly requested to bring their copies of documents to the meeting.

2/ The session will follow the forty-second session of the Meeting of Experts on Brakes and Running Gear (1-3 September 1997) in order to facilitate the participation of the experts from the tyre industry in the consideration of this agenda item.



2. Amendments to Regulations related to two-and three-wheeled vehicles:
  - 2.1. Regulation No. 9 (Noise of three-wheeled vehicles)
  - 2.2. Regulation No. 63 (Noise of mopeds)
  - 2.3. Regulation No. 92 (Replacement silencing systems for motorcycles)
3. Amendments to Regulation No. 51 (Noise of M and N categories of vehicles)
4. Preparation of the 1997 Regional Conference on Transport and the Environment
  - 4.1 Construction requirements on vehicles in international traffic
  - 4.2. Technical requirements on vehicles in use (periodic inspections of vehicles in international transport)
5. Definition of testing provisions in noise Regulations
6. Exchange of information on national and international requirements on noise levels 3/
7. Other business
  - 7.1. Traffic noise modelling

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3/ Delegations are invited to submit brief statements on the latest status in national requirements (if applicable) and, if necessary, to supplement this information orally.

Annex

LIST OF INFORMAL DOCUMENTS DISTRIBUTED WITHOUT A SYMBOL DURING THE SESSION

No.	Transmitted by	Agenda item	Language	Title
1.	Russian Federation	3.	E/R	Proposal for a draft corrigendum to Regulation No. 51
2.	Preparatory Committee of the Regional Conference on Transport and the Environment	4.1.	E	Proposal for draft amendments to the 1971 European Agreement supplementing the 1968 Vienna Convention (Redistribution of informal document No. 105 to the 13th session of the Preparatory Committee)
3.	Preparatory Committee of the Regional Conference on Transport and the Environment	4.2.	E	Draft proposal for an Agreement concerning the adoption of uniform conditions for periodical technical inspections of wheeled vehicles (Redistribution of informal document No. 106 to the 13th session of the Preparatory Committee)
4.	Preparatory Committee of the Regional Conference on Transport and the Environment	4.2	E	Agreement concerning the adoption of uniform conditions for the periodical technical inspections of wheeled vehicles; Draft Addendum 1 - Rule No. 1 (Redistribution of informal document No.. 107 to the 13th session of the Preparatory Committee)
5.	Japan	3.	E	An investigation into urban driving modes in Japan
6.	Japan	6.	E	Notification to the WTO concerning Partial Revision of the Safety Regulations for Road Vehicles Act Regarding Motor Vehicle Noise
7.	OICA	1.1., 1.2.	E	Draft amendment proposals to ECE Regulations Nos. 30 and 54 to insert provisions regarding tyre/road noise limitation - OICA comments on documents TRANS/WP.29/GRB/R.140 and TRANS/WP.29/GRB/R.141
8.	United Kingdom	1.1., 1.2.	E	Assessment of the proposed European tyre noise type approval method (TRL Project Report PR/SE/228/96)

No.	Transmitted by	Agenda item	Language	Title
9.	Russian Federation	1.1., 1.2.	E	Proposal for an additional draft amendment to Regulations Nos. 30 and 54, in relation to provisions limiting the noise generated by rolling tyres (doc. TRANS/WP.29/GRB/R.140 and TRANS/WP.29/GRB/R.141)
10.	ISO	3.	E	ISO 362 - 1997 Modification (Presentation to United Nations Experts on Noise (GRB))
11.	ISO	3.	E	ISO/DIS 362: Acoustics - Measurement of noise emitted by accelerating road vehicles - Engineering method
12.	OICA	7.	E	AAMA CNM Version 4.0 (Roger L. Wayson, John MacDonald, Ron Eaglin - University of Central Florida)
13.	OICA	3.	E	Light vehicle exterior noise: An urban drive cycle compared with existing pass-by test methods (SAE Cooperative Research Program)