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PROPOSAL FOR FURTHER DEVELOPMENT OF PROVISIONS
FOR VEHICLE STEERING CONTROL, HANDLING AND STABILITY
(UNECE REGULATION No. 79)

Note: The present document was prepared by the experts from Russian Federation for further development of recent proposals (documents TRANS/WP.29/GRRF/2005/4 and GRRF-58-15).

A. PROPOSAL

The experts from Russian Federation consider necessary to continue work on further development of provisions for vehicle steering control, handling and stability and ask GRRF support in preparing the relevant amendments to Regulations Nos. 79 and 13.

In this regard, the experts from Russian Federation invite the interested parties, in view of their obtained experience, for discussion at GRRF the test methods including those carried out on the roads with low adhesion coefficient and those designated for evaluation of systems intended for improvement of vehicle stability.

B. JUSTIFICATION

1. The experts from Russian Federation recently drew up the attention of GRRF to necessity of further development of requirements of the requirements, both to performance of steering control, and to the characteristics of vehicle handling:

1.1. Several provisions of the Regulation No. 79 need to be more specified. The lack of the particular requirements leads to subjective interpretation of the provisions.

1.2. Subjective approach to evaluation of vehicle handling should be complemented or substituted by interpretation of results of instrumented measurements.

1.3. In connection with being carried out active introduction of electronic auxiliary steering systems and systems for improvement of vehicle stability by selective application of brake mechanisms of separate wheels of a vehicle, the problem of compatibility of various auxiliary systems and regular vehicle steering system controlled by driver becomes important. The experts from Russian Federation consider that at the present time there are no enough technical provisions for evaluation of safety of vehicles equipped with such systems. It is necessary to have clear evidence that the failure of such systems essentially would not worsen performance of steering control, and the characteristics of vehicle handling under all possible driving conditions.

In several cases the operation of such systems does not promote improvement of handling and stability of a vehicle, which can be illustrated with the results of tests (see Annex).

2. The activity of the GRRF ad-hoc group on Electronic Vehicle Stability Control (EVSC) at the present time is designated to development of provisions for heavy vehicles and their trailers, however the issue of improvement of stability and correct operation of EVSC systems is not less urgent, for example, for heavy vehicles of categories M1 and N1, including, armored and multi-purpose utility vehicles.

3. In Russian Federation the research directed on development of a technique of evaluation of vehicles equipped by electronic systems of auxiliary steering and stability control is being carried out. However, the data available to the present time are not enough for preparation of proposals on test methods and technical provisions. The similar research activities are now on process in the United States.

4. The techniques directed on increase of objectivity of test results, in particular recording of the driver's steering inputs in relation to the position of vehicle on the trajectory, have been developed and put into practice.

The afore said allows to submit for consideration of GRRF the proposals for amendments to Regulation No. 79 which, in opinion of the experts of Russian Federation, will promote increase of objectivity of the technical provisions for efficiency of steering systems, handling and stability of vehicles.

ANNEX

Test results of braking in a turn (radius 105 m) of a passenger car equipped with antilock braking system (ABS) and electronic vehicle stability control system (EVSC) in a μ -split condition (left board – wet asphalt-concrete surface, $\mu = 0.75$, right board – wet basalt surface, $\mu = 0.2$).

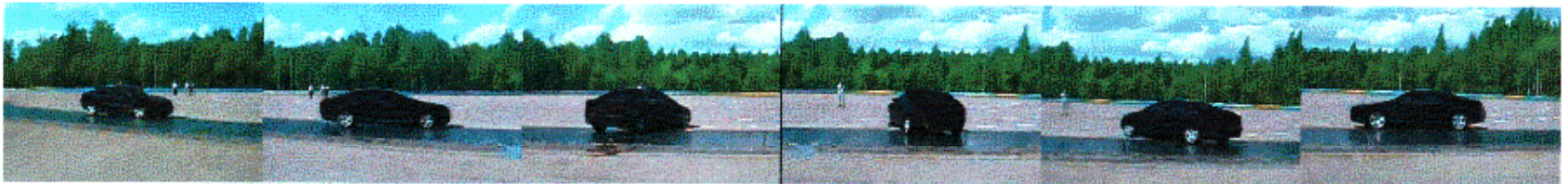


Fig. 1. Regular production vehicle, braking from speed 70 km/h, angle of vehicle rotation was 180 degrees.



Fig. 2. Vehicle of the same manufacturer, version with increased mass (40...100% higher than mass of a regular production vehicle shown on the Fig. 1), braking from speed 50 km/h, angle of vehicle rotation was 720 degrees. The not expected results of the vehicle with increased mass led to the conclusion about incomplete compatibility of auxiliary systems intended to ensure vehicle stability.