

Transmitted by the expert from Russian Federation

PROPOSAL BY THE EXPERT FROM RUSSIAN FEDERATION
INTRODUCING ADDITIONS INTO THE DRAFT AMENDMENTS
TO THE ECE REGULATIONS No. 13 (DOCUMENT EVSC-05-38)

Notes:

1. The present document reflects the point of view of the experts of Russian Federation concerning probable addition to the contents of the draft amendments to the ECE Regulations No. 13, containing provisions to Electronic Vehicle Stability Control (EVSC) systems, taking into consideration the comments made during discussion of the said document on the 58th GRRF session.
2. The present document is considered as a basis for preparation of the proposals for amendments of the document EVSC-05-38 (6th EVSC meeting document).

A1. PROPOSAL

To include in the text of the document the evaluation criterion for EVSC systems. At the first stage the maximum speed of driving of a vehicle on a circle of constant radius can be suggested. Speed limit and radius of a circle should be chosen, proceeding from a capability of safe movement on turns on roads of the certain categories on the certain operational speed. The speed limit should be set for conditions of high and low adhesion coefficient.

B1. JUSTIFICATION

One of the comments made at discussion of the document GRRF-58-12 on the 58th GRRF session was absence of results and criteria, which would allow evaluate objectively operation of EVSC systems, first of all, from a safety standpoint.

The safety is not characterized by the greatest possible vehicle speed. However, if we had verified, that a vehicle at given speed, radius of curvature and adhesion coefficient would keep the stability, we shall be sure, that it will keep the stability on public roads of the certain

categories at the certain operational speeds. This point of view supports a position of Mr. Galvarro and does not contradict a position of Messrs. Heess and Hecker (see document EVSC-05-28, page 2).

Generally speaking, the proposed in the item A1 evaluation criterion is rather universal, and it can be offered for evaluation of stability of any vehicle, regardless to that, whether it is equipped with EVSC system or not.

Besides that, this proposal will allow verifying of results of computer simulation, which will be used for confirmation of compliance of all applied vehicle configurations, at realization real tests of one sample.

In more detail the proposal of the above-mentioned evaluation criterion was justified in the document EVSC-05-18 transmitted by the expert from Russian Federation.

A2. PROPOSAL

To include in the text of the document a provision that in case of submission for confirmation of compliance of results of computer simulation, the reliability of results of such simulation shall be confirmed by the results of real tests of one vehicle sample. It is proposed, that with the type approval purpose the results of simulation, at least, of tests necessary for confirmation of compliance with the evaluation criterion proposed above (see the item A1)

B2. JUSTIFICATION

At the discussion of the document GRRF-58-12 on the 58th GRRF session, the comment was made on inadmissibility of use with the purposes of confirmation of compliance of results of computer simulation without appropriate comparison of simulation results with results of real tests.

The most simple and, it is possible to tell, standard method of real tests, which results are used for verification of computer models, is the motion of a vehicle with constant speed on a circle of constant radius. Certainly, these results cannot be considered enough of for complete verification, which will require also test results on transitive modes of motion, when vehicle yaw rate changes. The question of complete computer model verification can be considered separately later.

If the correlation of results of real tests and computer simulation will be considered satisfactory, with the help of computer simulation the conformity to the established evaluation criterion of all applied modifications can be shown.

A3. PROPOSAL

To include in the text of the document a provision that at the evaluation of EVSC performance, it should be confirmed, that EVSC does not interfere with the driver in realization of control inputs (steering angle, steering angular velocity). This conclusion should cover all possible driving modes and road conditions.

It is proposed to use for such confirmation the single lane change test maneuver, which has passed long-term approbation in Russian Federation. The tests should be carried out with EVSC enabled and disabled. In both cases the limiting speed of the test maneuver should not differ significantly.

B3. JUSTIFICATION

By the present time the experts from Russian Federation have the data on undesirable influence of EVSC systems of vehicle stability control in certain road conditions. Thus the vehicle does not trace a set trajectory and drifts outside the limits of a lane. Such situation is dangerous in case of detour of an obstacle and lane change, connected to it.

In particular, on roads with low adhesion coefficient, the higher test results (the speed of test runs) have been observed for the vehicles with disabled EVSC systems than for the same vehicles with enabled systems. It is connected to the fact that operation of such systems is directed on prevention of the tendency to oversteer. Thus the time of vehicle response on the driver's steering input is increased and the tendency to understeer is demonstrated.

The afore-said statement is more characteristic for single relatively heavy vehicles of M1G category, as well as for armored vehicles. In case of tractor-trailer combinations with central-axle trailers, the trailer pushes the tractor out the limits of a set lane.

The choice of the applied in Russian Federation single lane change test maneuver for the purpose of such confirmation is justified in more details in the documents EVSC-05-18 and GRRF-58-17.

Reproduction of such test maneuver by methods of computer simulation is unnecessary, however, it could be possible, that the Technical Service should require tests of the "worst case" at its choice agreed with the vehicle manufacturer.
