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World Forum for Harmonization of Vehicle Regulations

Working Party on Brakes and Running Gear

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Item 3(h) of the provisional agenda

REGULATIONS Nos. 13 AND 13-H (Braking)

Electronic Vehicle Stability Control

Proposal for amendments to Regulation No. 13

Submitted by the experts from the European Association of Automotive Suppliers (CLEPA)[*]

The text reproduced below was prepared by the experts from CLEPA to extend the scope of Annexes 19 and 20 to Regulation No. 13 in order to include an option for motor vehicle stability systems with the objective for a stability control system to be assessed by a technical service in the same way as trailer braking components including ABS and stability control. It is based on informal document No. GRRF-64-11, distributed at the sixty-fourth session of the Working Party on Brakes and Running Gear (GRRF) (see report ECE/TRANS/WP.29/GRRF/64, para. 19). The modifications to the existing text of the Regulation are marked in **bold** characters.

[*] In accordance with the programme of work of the Inland Transport Committee for 2006-2010 (ECE/TRANS/166/Add.1, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance performance of vehicles. The present document is submitted in conformity with that mandate.

A. PROPOSAL

Annex 19

The title, amend to read:

"PERFORMANCE TESTING OF ~~TRAILER~~ BRAKING **SYSTEM** COMPONENTS"

After the title, insert a new section heading, to read:

"**A. PERFORMANCE TESTING OF TRAILER BRAKING COMPONENTS**"

Paragraph 1., amend to read:

"1. General

This ~~annex~~ **section** defines the test procedures applicable in defining the performance of the following:"

After paragraph 6.6.1., add a new section B, to read:

"**B. PERFORMANCE TESTING OF MOTOR VEHICLE BRAKING COMPONENTS**

1. General

This section defines the procedures applicable in defining the performance of the following:

1.1. A vehicle stability function

1.2. A test report for the above may be used in conjunction with the procedures defined in section B of Annex 20 to this Regulation or at the time of evaluating a motor vehicle which is being subject to actual performance requirements defined for the respective motor vehicle

2. Vehicle stability function

2.1. General

2.1.1. This section defines the procedure to determine the dynamic characteristics of a vehicle equipped with a vehicle stability function as specified in paragraph 5.2.1.32. of this Regulation.

2.2. Information document

2.2.1. The system/vehicle manufacturer shall supply to the Technical Service an information document of the control function(s) for which performance verification is required. This document shall contain at least the information defined in Appendix 11 to this annex.

2.3. Definition of test vehicle(s)

2.3.1. Based on the stability control function(s) and their application(s) defined in the manufacturer's information document, the Technical Service shall carry out a performance verification. This may include one or more dynamic manoeuvres as defined in paragraph 2.1.3. of Annex 21 to this Regulation on a motor vehicle(s) which is representative of the application(s) defined in paragraph 2.1. of the manufacturers information document.

2.3.2. When selecting the motor vehicles(s) for evaluation, consideration shall also be given to the following:

(a) Vehicle configuration e.g. 4x2, 6x2 etc.

(b) Braking system: the braking system of the motor vehicle(s) to be evaluated shall comply with all of the relevant requirements of this Regulation.

(c) Brake type: approval shall be limited to motor vehicles with pneumatically or hydraulically operated drum brakes, disc brakes or a combination of either of these brakes but should other types become available, then comparative testing may be required.

2.4. Test schedule

2.4.1. To evaluate the vehicle stability control function the tests used shall be agreed between the system/vehicle manufacturer and the Technical Service and shall include conditions, appropriate to the function being evaluated, that would without the intervention of the stability control function result in loss of directional control or roll-over. The dynamic manoeuvres, test conditions and results shall be included in the test report.

2.5. Test report

2.5.1. A test report shall be produced, the content of which shall be at least that defined in Appendix 12 of this annex."

Add new Appendices 11 and 12 to Annex 19, to read:

"**Annex 19 – Appendix 11**

VEHICLE STABILITY FUNCTION INFORMATION DOCUMENT

1. General

1.1. Name of manufacturer

1.2. System name

1.3. System platform

1.4. System options

1.4.1. Control function (directional / roll-over / both) including an explanation of the basic function and/or philosophy of the control

1.5. System configurations (where appropriate)

1.6. System identification

2. Applications

2.1. List of motor vehicle types and configurations for which approval is required

2.2. Schematic diagrams of the respective configurations installed on the motor vehicles defined in item 2.1. above with consideration given to the following:
(a) Lift axles
(b) Steering axles
(c) Anti-lock braking configurations

2.3. Scope of application with respect to suspension type:
(a) Air suspension:
(b) Mechanical suspensions
(c) Mixed suspensions comprising of a combination of (a) and (b) above

2.4. Additional information (if applicable) to the application of the directional control and roll-over control function(s)

3. Component Description

3.1. Sensors external to the controller
(a) Function
(b) Limitations on the location of the sensors
(c) Identification, e.g. part numbers

3.2. Controller(s)
(a) General description and function
(b) Identification e.g. part numbers
(c) Limitations on the location of the controller(s)
(d) Additional features

3.3. Modulators
(a) General description and function
(b) Identification
(c) Limitations

3.4. Electrical Equipment
(a) Circuit diagrams
(b) Powering methods

3.5. Pneumatic circuits
System schematics including anti-lock braking configurations associated with the motor vehicle types defined in paragraph 2.1. of this appendix

3.6. Safety aspects of the electronic system in accordance with Annex 18 to this Regulation

3.7. Electro-magnetic compatibility

3.7.1. Documentation demonstrating compliance with Regulation No. 10 including the 02 series of amendments.

Annex 19 –Appendix 12

VEHICLE STABILITY FUNCTION TEST REPORT

Test Report No: …….

1. Identification:

1.1. Manufacturer of the vehicle stability function (name and address)

1.2. Applicant (if different from the manufacturer)

1.3. System platform

1.3.1. System variants

1.3.2. System options

1.3.2.1. Control functions

2. System(s) and installations:

2.1. Anti-lock braking configurations (where appropriate)

2.2. Vehicle applications

2.2.1. Vehicle category (e.g. N_2, N_3, etc):

2.2.2. Vehicle type(s)(e.g. Tractor, bus, etc.):

2.2.3. Vehicle configuration(s) (e.g. 4x2, 6x2 etc):

2.3. System identification

2.4. Additional features

3. Test data and results:

3.1. Test vehicle data (including the specification and functionality of any trailer(s) used during the test(s))

3.2. Test surface information

3.3. Additional Information

3.4. Demonstrative tests/simulations used for the purpose of evaluating the directional control and the roll-over control as appropriate.

3.5. Test results

3.6. Assessment in accordance with Annex 18 to this Regulation

4. Limits of installation

4.1. Suspension type

4.2. Brake type

4.3. Location of components on the motor vehicle

4.4. Anti-lock braking configurations

4.5. Other recommendations/limitations (e.g. lifting axles, steering axles, etc.)

5. Attachments

6. Date of test:

7. This test has been carried out and the results reported in accordance with Annex 19, Section B to ECE Regulation No. 13 as last amended by the …… series of amendments.

Technical Service 1/ conducting the test

Signed: ……. Date: ……

8. Approval Authority 1/

Signed: ……. Date: ……

1/ To be signed by different persons even when the Technical Service and Approval Authority are the same or alternatively, a separate Approval Authority Authorisation issued with the report."

Annex 20

The title, amend to read:

"ALTERNATIVE PROCEDURE FOR TYPE APPROVAL ~~OF TRAILERS~~"

After the title, insert a new section heading, to read:

"**A. ALTERNATIVE PROCEDURE FOR THE TYPE APPROVAL OF TRAILERS**"

Paragraph 1., amend to read:

"1. General

This ~~annex~~ **section** defines an alternative procedure for type approving trailers, utilizing information from test reports issued in accordance with Annexes 11 and 19.

After paragraph 9.1.9.1., add a new section B, to read:

"**B. ALTERNATIVE PROCEDURE FOR THE TYPE APPROVAL OF MOTOR VEHICLES**

1. General

1.1. This section defines an alternative procedure for type approving motor vehicles or demonstrating compliance with specific requirements within Regulation No. 13, utilizing information from test reports issued in accordance with section B of Annex 19.

1.2. On completion of the verification procedures described in paragraph 3. of this section, the Technical Service / Approval Authority shall issue an ECE type approval certificate conforming to the model specified in Annex 2, Appendix 1 to this Regulation.

2. Application for type approval

2.1. The application for ECE type approval of a motor vehicle type with regard to the braking equipment shall be submitted by the motor vehicle manufacturer. In support of the approval the motor vehicle manufacturer shall supply to the Technical Service at least the following:

2.1.1. Copies of the Annex 19 section B test report(s).

2.1.2. A documentation package that contains the relevant verification information including the relevant calculations for the following:

Performance Requirements	Annex 20 reference
Vehicle stability function	3.0

3. Alternative procedure for demonstrating the performance of a motor vehicle equipped with a vehicle stability function.

3.1. Evaluation of a motor vehicle in accordance with paragraph 2. of Annex 21 to this Regulation may be waived at the time of motor vehicle type approval provided that the vehicle stability function complies with the relevant requirements of Annex 19 section B to this Regulation.

3.2. Verification

3.2.1. Verification of components and installation

The specification of the braking system, in which the stability control function is integrated and installed on the trailer to be type approved shall be verified by satisfying each of the following criteria:

	Condition	Criteria
3.2.1.1.	(a) Sensor(s) (b) Controller(s) (c) Modulator(s)	No change allowed No change allowed No change allowed
3.2.1.2.	Motor vehicle types as defined in the test report	No change allowed
3.2.1.3.	Installation configurations as defined in the test report	No change allowed
3.2.1.4.	For other limitations refer to paragraph 4. of the test report as described in Appendix 12 of Annex 19 to this Regulation.	No change allowed

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B. JUSTIFICATION

Demonstrating the functionality of the stability control function for the purposes of vehicle type approval is very onerous on both the vehicle manufacturer and the component supplier due to the nature of the tests and facilities required for this purpose. Realistically, the stability control function which is integrated into the motor vehicle includes the same basic components and functionality irrespective of the vehicle type. Minor changes of parameters to suit specific vehicle characteristics, such as wheelbase and centre of gravity values, may be necessary but the system itself remains unchanged. Any such variables would be assessed during the application of the proposed procedure. Currently, approval of a vehicle stability function is limited to a demonstration of the specified function and, as an alternative, the use of simulation is possible as it was recognized that an in-depth investigation at the time of type approval would be onerous and costly for little benefit. As a result, it is proposed that an additional option to gain type approval should be considered by permitting a more in-depth assessment of the vehicle stability function. Thereafter, controlling the installation of respective system components based on the observations of the assessment which would include much more than a single witnessed demonstration.

The procedure defined above is a draft based on the well-known principles that have been applied to trailer anti-lock braking systems and expanded over the years to include other elements of the trailer braking system, the latest being the trailer stability function. Expertise, associated with function and application lies with the manufacturer of the vehicle stability function. The system may be subject to a more rigorous investigation by a technical service. A test report would then be produced and provide a better understanding of system limitations. This report could then be applied to other vehicles. The report would apply only to the vehicle types which are covered by the scope of the report in a similar way to that applied to vehicle simulation. Where there are tolerances on the installation of components. it would be necessary to ensure the system continued to fulfil the fundamental functionality required by the Regulation, any such limitations being defined within the system information document and test report and checked at the time of type approval.

As a result of the experience gained in the application of this principle on trailers, it is believed that what is being proposed is a realistic alternative to the current provisions of Annex 21. The application of such a procedure will also result in significant cost savings for motor vehicle manufacturers and system suppliers as repeated low adhesion testing which can only be safely carried out during the winter test period would be removed.

The procedure defined within the document is a draft to illustrate the principle proposed and is likely to require further development. However, it is considered important that GRRF delegates are given the opportunity to comment on the principle. If acceptable, the industry would be prepared to convene meetings, to which interested parties would be invited, with a view to presenting a fully developed procedure to GRRF.

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