Transmitted by the expert from Italy

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agenda item 5(b))

Proposal for amendments to ECE/TRANS/WP29/GRRF/2014/4

I. Proposal

A. Insert a new proposed amendment

Paragraphs 4.4.2 (c), 4.5.2 (c), and 4.9.3.1 (c), amend to read:

"(c) Brake application:

Simultaneous actuation of both ~~service~~ brake ~~system~~ controls~~, if so equipped,~~ **in the case of a vehicle with two service brake systems** or **actuation** of the single ~~service~~ brake ~~system~~ control in the case of a **vehicle with one** service brake system ~~that operates on all wheels~~."

B. Amend the current text in proposed amendment

Paragraph 4.12.1., amend to read:

"4.12.1. General information:

(a) This test will only apply to vehicles fitted with CBS of which the separate service brake systems share a common **hydraulic** brake~~,~~ **or** common **mechanical** transmission or both;

(b) The test is to confirm the performance of the service brake systems in the event of a common hydraulic hose or mechanical cable failure."

Paragraph 4.12.2., amend to read:

"4.12.2. Test conditions and procedure:

(a) Alter the brake system to ~~produce~~ **simulate** a ~~hydraulic hose or mechanical cable type~~ failure causing a complete loss of braking in the portion of the system which is shared.

(b) Perform the dry stop test specified in section 4.3. in **the** laden condition. Other conditions to be observed are 4.3.1. (c) and 4.3.2. (a), (b), (d), (e) and (f). Instead of the provisions in section 4.3.2. (c), only apply the control for the service brake system not affected by the simulated failure."

Delete the cross reference in the Justification

"**Other CBS architectures such as Architecture C**

13. A failure test is not necessary for this type of CBS architecture because there are no shared components with the exception of a brake cylinder which is one of the components that are regarded to not be liable to breakage ~~as described in 4.12.1. (b)~~."

II. Justification

A. The proposed amendment to 4.4.2 (c), 4.5.2 (c), and 4.9.3.1 (c) – brake application:

The intent of this paragraph in gtr No. 03 is to ensure that systems with one service brake meet braking performance requirements using only that brake system. This prevents manufacturers from producing systems that rely on the secondary brake to meet primary braking performance requirements.

The text was not intended to prevent simultaneous actuation of controls where two service brake systems are present, even if one or both are CBS.

However, there was an interpretation by a type approval authority that for CBS with two service brake systems, actuating each single control must meet the requirements for simultaneous actuation of both controls on an independent system because that brake control operates on both wheels.

This creates significantly more stringent requirements for CBS than was intended by gtr No. 03 and may have the effect of restricting CBS implementations. The result may be fewer CBS and more independent systems. As CBS provides more rider benefits this is not desirable.

To quantify how much more stringent the type approval authority's interpretation is; comparison to section 4.3, which defines the CBS performance requirements, can be used. The table below shows that with the type authority's interpretation CBS performance would have to be 20 to 30 percent greater than intended by gtr No. 03.

	Performance Requirements	
gtr-03 section	**MFDD (m/s^2)**	**Stopping Distance (m)**
4.3	5.1	33.36
4.9.3	6.17	22.68
Difference	21%	32%

Direct comparisons to sections 4.4 and 4.5 are more difficult due to different test speed requirements, but a relative analysis shows that with the type authority's interpretation CBS performance would have to be 30-35% greater for section 4.4 and 10-15% greater for section 4.5.

CBS requirements are already more stringent than for Independent systems. Front CBS performance must be 15% greater than front Independent systems and rear CBS performance must be 75% greater than rear independent systems.

To avoid placing excessively stringent requirements on CBS and to clarify the intent of gtr No. 03 the following proposals is being made for sections 4.4.2 (c), 4.5.2 (c), and 4.9.3.1 (c).

B. To clarify to which parts of the braking system should be considered with respect to hydraulic brake and mechanical transmissions

C. In the test conditions and procedure, there was a need to simulate a failure rather than producing a failure.