

Revised proposal to amend UN Global Technical Regulation No. 3 (Motorcycle brake systems)

Based on ECE/TRANS/WP.29/GRRF/2017/15

The text reproduced below was prepared by the expert from Italy proposing amendments to Global Technical Regulation (GTR) No. 3. It is a revised version of the proposal ECE/TRANS/WP.29/GRRF/2017/15 distributed at the eighty-fourth session of the Working Party on Brakes and Running Gear (GRRF). The modifications to the text of GTR No. 3 are marked in bold for new characters or strikethrough for deleted characters. The revisions from the ECE/TRANS/WP.29/GRRF/2017/15 are marked in track changes mode.

I. Statement of technical rationale and justification

A. Introduction

1. One of the main purposes of Global Technical Regulation (GTR) No. 3 is to reduce the injuries and fatalities associated with motorcycle accidents by addressing the braking performance of motorcycles as a means of improving road safety.
2. GTR No. 3 provides clear and objective test procedures and requirements that can be easily followed and also addresses the development of current Combined Braking Systems (CBS) and Anti-lock Braking System (ABS) technologies.
3. The objective of this proposal is to amend the current GTR No. 3 to technical progress addressing: electromagnetic immunity of ABS-systems, introducing ABS performance requirements for category¹ 3-5 vehicles (three-wheelers), ensuring uniform requirements for equipment such as Electronic Stop Signal (ESS) system and the means to disable the ABS, if equipped.

B. Justification of changes

4. The proposals aim to harmonise the GTR with the recent Supplement 3 to the 03 series the recent amendment to Regulation No. 78 as adopted at June 169th session of WP.29 and the 04 series of amendments as adopted during the 170th session of WP.29.
5. The development of draft language for updating the GTR involved consideration of the differences between the respective 1998 Agreement and 1958 Agreement. Specific solutions for the different technical items have been developed whereby GRRF experts were requested to support and contribute in the process. The main technical issues, including their justification for updating the global technical regulation are:

¹ As defined in the Special Resolution No. 1 concerning the common definitions of vehicle categories, masses and dimensions (S.R.1), document ECE/TRANS/WP.29/1045, Amend 1 and 2, Annex 2 - www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html

1. Electromagnetic immunity of ABS systems, paragraph 3.1.14.

6. With the increasing number and complexity of electronic braking devices, it is important to ensure that the braking performance is not affected electromagnetic perturbations by verifying the electromagnetic immunity. This GTR No. 3 amendment proposal is harmonised with Regulation No. 78, Supplement 3 to the 03 series (ECE/TRANS/WP.29/2016/56, amended by WP29-169-03). The specificities of self-certification have been considered, by providing for Contracting Parties to this GTR, to refer to national standards or to national regulations, in the case EMC-regulations if applicable in their national or regional situation.

2. Apply existing Anti-Lock Braking Systems (ABS) requirements to all vehicles of category 3, paragraph 4.9.1.

7. ~~If~~ **To** apply the existing Anti-Lock Braking Systems (ABS) requirements to all vehicles of category 3, based on ECE/TRANS/WP.29/GRRF/2015/42. If such vehicles were equipped with ABS, without the amendment, there would be no specific requirements for the ABS braking performance in the GTR. This GTR No. 3 amendment proposal is harmonised and maintains technical compatibility with Regulation No. 78, Supplement 3 to the 03 series (ECE/TRANS/WP.29/2016/56, amended by WP29-169-03). The specificities of the 1998 Agreement have been taken into account as the scope extension of the ABS requirements is not extended to quadricycles (L₆ and L₇) vehicles² as due to the absence of definitions for this type of vehicles in Special Resolution adopted by the Executive Committee (AC.3) of the 1998 Agreement (S.R.1) relevant for the 1998 Agreement.

3. Emergency Stop Signal, paragraph 2.2.2. and 3.1.15. to 3.1.15.2.

8. The paragraphs 2.2.2. and 3.1.15. to 3.1.15.2. aim to introduce the installation of ESS on motorcycles. This proposed amendment involves only the condition of activating an ESS, not the lighting requirements. ESS is available on the market for motor vehicles. As motorcycles are used in the same traffic conditions, the option was considered to be beneficial also on motorcycles. The benefit of defining ESS provisions for vehicles of category 3 is to ensure similar behaviour as other road vehicles by harmonising the activation and deactivation criteria of ESS as applied to cars.

9. This GTR No. 3 amendment proposal is harmonised with Regulation No. 78, Supplement 3 to the 03 series (ECE/TRANS/WP.29/2016/56, amended by WP29-169-03). The associated amendment of Regulation No. 53 (lighting installation for L₃ vehicles) was adopted at 168th session of WP.29 (ECE/TRANS/WP.29/2016/22).

4. Means to disable the ABS function, paragraph 3.1.16.

10. The new paragraph 3.1.16. clarifies the requirements of a means to disable the ABS function, if fitted, ('ABS Switch') for vehicles of Category 3. With this amendment, it is ensured that the implementation of an 'ABS switch' is clear and uniform across different markets: *i.e.* if a vehicle is equipped with a function to disable the ABS, the ABS operation status should be clear when starting, when in motion. In addition, disabling the ABS function should not be possible inadvertently.

² As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.5, para. 2 - <https://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29resolutions/ECE-TRANS-WP.29-78r5e.pdf>

11. The proposal maintains technical compatibility with the 04 series of amendments to the Regulation No. 78 (ECE/TRANS/WP.29/2016/114 as amended by WP29-170-06 adopted at the eighty-second session of GRRF with minor editorial corrections), with only changes necessary to account for Contracting Parties under the 1998 agreement. **The proposal ensures technical compatibility of the requirements without reproducing the exact language in the UN Regulation No. 78.**

12. The proposal is based on informal document GRRF-83-09 by Italy and subsequent discussion in GRRF. The suggestions made by the representative of Canada (see GRRF-83-10) to include language about switching ‘modes’ to eliminate confusion with inconsistent use of terms ‘deactivate’ and ‘disable’ have been incorporated. It was advised to have the benefit of harmonized language similar to GTR No. 8, for ESC for vehicles of Category 1-1, 1-2 and 2. Situations described in the GTR No. 8 rationale (paragraph 83) for why different modes are needed did not seem applicable to motorcycle ABS. Simple ON/OFF functionality is considered sufficient. To address comments of inconsistencies of word use, the text was updated to refer simply to ‘disable’ or ‘enable’.

13. On GRRF-83-09 by the representative of Italy, the representative of Canada also advised on the term ‘other equivalent unequivocal indication’ which was deemed ambiguous and therefore not appropriate in a self-certifying environment. In order to be similar to the approach of GTR No. 8, the International Standardization Organization (ISO) symbol for ABS with the word ‘OFF’ under it was suggested. In the current GTR No. 3 amendment proposal, the ambiguous text was removed and the disable tell-tale suggested was included. As there are multiple unequivocal indicators currently accepted in ISO (or other standards) they were also specified as acceptable in this proposal. This includes the use of the text ‘ABS OFF’ consistent with the use of text “ABS malfunction warning lamp” in the Federal Motor Vehicle Safety Standard (FMVSS) 122.

14. The ability to use the ABS malfunction indicator to also indicate disabled was retained in recognition of the limited space on a motorcycle as compared to a car and recognizing that tell-tale unequivocally indicates ABS is not available to the rider.

15. Following discussion at 84/GRRF, as suggested by Canada in GRRF-84-10, the Paragraph 5.1.15.3 from UN Regulation No. 78: ‘The method of determining deceleration is the responsibility of the manufacturer as long as the vehicle meets the technical requirements of this section. (ex. a prediction of deceleration from wheel rotation).’ was not taken across to the GTR as it was considered unnecessary in a self-certification system and keep the text certification neutral.

16. Sub-point (g) in this GTR amendment proposal, which makes it more explicit that manufacturers cannot provide additional means of disabling ABS, is included as a means of preventing defeat devices to be introduced. This supports direction requested by the Contracting Parties at 84/GRRF who feel this prohibition needs to be explicit and allows a provision that is acceptable in self-certifying markets.

C. Countries that have incorporated GTR No. 3 into their regulations

Canada

European Union

Japan

Republic of India

Republic of Korea

Russian Federation

~~Turkey~~

United States of America

II. Proposed amendments

Insert a new paragraph 2.22. and 2.23., to read:

"2.22. "Emergency braking signal" means logic signal indicating emergency braking specified in paragraphs 3.1.15. to 3.1.15.2. of this Regulation."

"2.23. "disable the antilock brake system" means to put the system into a state where it will no longer fulfil the technical requirements of section 4.9 of this regulation."

Insert a new paragraph 3.1.14., to read:

"3.1.14. The effectiveness of the braking systems, including the anti-lock system, shall not be adversely affected by magnetic or electrical fields.

This shall be demonstrated by fulfilling the technical requirements in national standards or regulations, if applicable."

Insert new paragraphs 3.1.15. to 3.1.15.32., to read:

"3.1.15. If a vehicle is equipped with the means to indicate emergency braking, activation and de-activation of the emergency braking signal shall only be generated by the application of any service braking system when the conditions in paras. 3.1.15.1. through 3.1.15.3. are fulfilled:

3.1.15.1. The signal shall not be activated when the vehicle deceleration is below 6 m/s² but it may be generated at any deceleration at or above this value, the actual value being defined by the vehicle manufacturer.

The signal shall be de-activated at the latest when the deceleration has fallen below 2.5 m/s²; or,

3.1.15.2. The signal may be activated at a speed above 50 km/h when the antilock system is fully cycling (as defined in paragraph 4.9.1.) and deceleration is at least 2.5 m/s². The signal shall be deactivated when the antilock system is no longer fully cycling".

~~3.1.15.3. The method of determining deceleration is the responsibility of the manufacturer as long as the vehicle meets the technical requirements of this section. (ex. a prediction of deceleration from wheel rotation)."~~

Insert a new paragraph 3.1.16., to read:

"3.1.16. If a means to disable the antilock brake system is ~~installed~~ provided it shall meet the following provisions:

(a) Disabling the antilock brake system function shall only be allowed when the vehicle is fitted with a ride mode selector that is in an "off-road" or "all-terrain" mode.

(ab) Disabling the antilock brake system function shall only be allowed when the vehicle is stationary;

(cb) Disabling the antilock brake system function shall be the result of a deliberate action by the rider according to one of the following methods:

- (i) Simultaneous actuation of the antilock braking system ~~on/off~~ **disable-switch** and a service brake system control (i.e. brake lever or pedal); or
 - (ii) The actuation of the antilock brake system ~~o~~**disable-n/off** switch for a minimum of two seconds; or
 - (iii) The progression through at least two successive steps or levels of actuation of a **control** (e.g., rotating knob, a touch panel or a menu option selector).
- (ed) The antilock brake system function shall be automatically enabled **when exiting from the “off-road” or “all-terrain” ride mode, or after each start-up of the vehicle, except for restarts after unintentional stalling of the engine.**;
- (~~e~~) Disabling the antilock brake system function shall be indicated by the activation of a **yellow or amber** tell-tale according to one of the following methods:
- (i) The symbol B.18 applied as specified in ISO 2575:2010 or
 - (ii) The symbol B.05 applied as specified in ISO 2575:2010 with the word “OFF” (according to Y.01 in ISO 2575:2010), or
 - (iii) ~~A yellow warning lamp with t~~The text “ABS OFF”, or
 - (iv) The warning lamp referred to in paragraph 3.1.13., continuously activated (i.e. lit or flashing).
- (e“f) Instantaneous enabling of a functional stage which complies with anti-lock brake system requirements in paragraph 4.9 shall be possible **through the single actuation of a control** (e.g. simple press of a button or switch);
- (g) **The manufacturer shall not make available to consumers hardware and/or software designed to allow a means of disabling ABS other than in compliance with the requirements set out in points (a) to ([c or f]).**
- ~~(i) This provision does not apply to what is required to service the ABS (e.g. electrical connectors). "~~
- ~~(f) Prohibition of any software and/or hardware defeat device compromising or allowing to circumnavigate one or more of the requirements set out in points (a) to (e)"~~

Paragraph 4.9.1., amend to read:

"4.9. ABS tests

4.9.1. General:

- (a) The tests are only applicable to the ABS ~~if fitted on vehicle categories 3-1 and 3-3 ...~~
- (b) The tests are to confirm the performance of brake systems equipped with ABS and their performance in the event of ABS electrical failure..."