

**Proposal for amendments to Regulations No. 12 (Protection of drivers against the steering mechanism in the event of impact), No. 94 (Protection of occupants against frontal collision) and No. 95 (Protection of occupants against lateral collision)**

**I. Proposal**

**A. Proposal for Supplement [02] to the 04 series of amendments to Regulation No.12 (Protection of drivers against the steering mechanism in the event of impact)**

*Paragraph 5.5.1.*, amend to read:

"5.5.1. Protection against electrical shock

After the impact at least one of the four criteria specified in paragraphs 5.5.1.1. to 5.5.1.4.2. shall be met.

If the vehicle has an automatic disconnect function or device(s) that galvanically divide the electrical power train circuit during driving condition, at least one of the following criteria shall apply to the disconnected circuit or to each divided circuit individually after the disconnect function is activated.

However criteria defined in 5.5.1.4. shall not apply if more than a single potential of a part of the high voltage bus is not protected under the conditions of protection IPXXB.

In the case that the test is performed under the condition that part(s) of the high voltage system are not energized, the protection against electrical shock shall be proved by either paragraph 5.5.1.3. or paragraph 5.5.1.4. for the relevant part(s)-

**For the coupling system for charging the REESS which is not energized during driving condition, at least one of the four criteria specified in paragraphs 5.5.1.1. to 5.5.1.4. shall be met."**

**B. Proposal for Supplement [03] to 02 series of amendments to Regulation No.94 (Protection of occupants against frontal collision)**

*Paragraph 5.2.8.1.*, amend to read:

"5.2.8.1. Protection against electrical shock

After the impact at least one of the four criteria specified in paragraph 5.2.8.1.1. through paragraph 5.2.8.1.4.2. shall be met.

If the vehicle has an automatic disconnect function, or device(s) that galvanically divide the electric power train circuit during driving condition, at least one of the following criteria shall apply to the disconnected circuit or to each divided circuit individually after the disconnect function is activated.

However criteria defined in 5.2.8.1.4. shall not apply if more than a single potential of a part of the high voltage bus is not protected under the conditions of protection IPXXB.

In the case that the test is performed under the condition that part(s) of the high voltage system are not energized, the protection against electrical shock shall be proved by either paragraph 5.2.8.1.3. or paragraph 5.2.8.1.4. for the relevant part(s)-

**For the coupling system for charging the REESS which is not energized during driving condition, at least one of the four criteria specified in paragraphs 5.2.8.1.1. to 5.2.8.1.4. shall be met."**

### **C. Proposal for Supplement [02] to the 03 series of amendment to Regulation No.95 (Protection of occupants against lateral collision)**

*Paragraph 5.3.6.1., amend to read:*

"5.3.6.1. Protection against electrical shock

After the impact at least one of the four criteria specified in paragraph 5.3.6.1.1. through paragraph 5.3.6.1.4.2. shall be met.

If the vehicle has an automatic disconnect function, or device(s) that galvanically divide the electric power train circuit during driving condition, at least one of the following criteria shall apply to the disconnected circuit or to each divided circuit individually after the disconnect function is activated.

However criteria defined in 5.3.6.1.4. shall not apply if more than a single potential of a part of the high voltage bus is not protected under the conditions of protection IPXXB.

In the case that the test is performed under the condition that part(s) of the high voltage system are not energized, the protection against electrical shock shall be proved by either 5.3.6.1.3. or 5.3.6.1.4. for the relevant part(s)-

**For the coupling system for charging the REESS which is not energized during driving condition, at least one of the four criteria specified in paragraphs 5.3.6.1.1. to 5.3.6.1.4. shall be met."**

## **II. Justification**

In the case that the high voltage system(s) is designed to be energized during driving condition, but such high voltage system(s) is not energized during the test due to any modification for test condition and/or measurement, judgment for compliance with electrical shock protection requirements by using the criteria prescribed in paragraph 5.2.8.1.1 (i.e. absence of high voltage) or paragraph 5.2.8.1.2 (i.e. low electrical energy) is inappropriate. Due to this, current regulation, in the case of R94, includes the restriction in paragraph 5.2.8.1 as following;

In the case that the test is performed under the condition that part(s) of the high voltage system are not energized, the protection against electrical shock shall be proved by either paragraph 5.2.8.1.3. or paragraph 5.2.8.1.4. for the relevant part(s).

Of course, identical restriction is also prescribed in both R12 (paragraph 5.5.1) and R95 (paragraph 5.3.6.1).

On the other hand, for the coupling system for charging the RESS in electric vehicle or plug-in hybrid electric vehicle, which is not designed to be energized during driving condition, such coupling system is not energized during and after the crash. In this case, if the coupling system can meet with either requirement prescribed in paragraph 5.2.8.1.1 and paragraph 5.2.8.1.2, protection against electrical shock which is the purpose of paragraph 5.2.8.1 is ensured.

Options of conformity to the requirements for electrical shock protection for such coupling system are not specifically mentioned in current regulation text. Therefore, depending on the interpretation provided by Technical Service, judgment for compliance with electrical shock protection requirements by using the criteria prescribed in paragraph 5.2.8.1.1 or paragraph 5.2.8.1.2 may be impermissible. This may affect the fairness of type approval.

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