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Item 5 (a) of the provisional agenda

Proposals for amendments to annexes A and B of ADR:**Construction and approval of vehicles****9.2.2.3 Circuits exempted from protection by fuse or automatic circuit breaker****Transmitted by the International Organization of Motor Vehicles
Manufacturers (OICA)****Summary*

Executive summary:	Proposal to add the line “from the starter battery to the electric steering equipment” into the list of circuits exempted from protection by fuse or automatic circuit breaker.
Action to be taken:	Amend ADR 9.2.2.3.
Related documents:	ADR 2023.

* A/78/6 (Sect. 20), table 20.5.



I. Background

1. The text of ADR mandates in 9.2.2.3 some electric protection against high current for all circuits, with a list of circuits that can be exempted from the mandatory protection due to their nature or the electric power they need.
2. The nature of some circuits is such that a circuit breaker would be detrimental to the proper functioning of the circuit itself and the equipment it feeds.
3. Some circuits need such high current that a fuse or circuit breaker is not reliable or even impossible to find on the market.
4. The introduction of and growing demand for electric vehicles is leading to an increase in the number of electric steering systems in the vehicle fleet. Those electric steering systems need high power, i.e. high current and voltage, to operate the steering mechanism.
5. The electrification of the fleet hence implies the high-power electrical circuits feeding electric steering systems.

II. Justification

6. The electric steering systems may reach such high temporary current intensities as those of the other exemptions listed in 9.2.2.3; i.e. the situation for the electric steering systems is similar to that of e.g. the electric axle lifting system.
7. Fuses for this kind of systems would have to be so large that they only have a symbolic value.

III. Proposal

8. Amend 9.2.2.3 as follows (addition of a new text in bold):

“9.2.2.3 Fuses and circuit breakers

All circuits shall be protected by fuses or automatic circuit breakers, except the following:

- From the starter battery to the cold start system;
- From the starter battery to the alternator;
- From the alternator to the fuse or circuit breaker box;
- From the starter battery to the starter motor;
- From the starter battery to the power control housing of the endurance braking system (see 9.2.3.1.2.) if this system is electrical or electromagnetic;
- From the starter battery to the electrical lifting mechanism for lifting the bogie axle;
- **From the starter battery to the electric steering equipment.**

The above unprotected circuits shall be as short as possible.”

IV. Conclusion

9. The proposed amendment ensures proper dimensioning of the electrical circuits and safe functioning of the steering systems.