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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****9.2.2.2.1 Cables****Transmitted by the Government of Germany****Summary*

Executive summary:	Germany has found that it is not possible to apply standards ISO 16750-4:2010 “Climatic loads” and ISO 16750-5:2010 “Chemical loads”, which are mentioned in 9.2.2.2.1 “Cables”, to vehicle wiring harnesses, cables and electrical connectors by means of ISO 16750-1:2006. Therefore, it is proposed to delete the reference to these standards. ISO 6722-1:2006 contains requirements for temperature and fluid resistance which are regarded as sufficient.
Action to be taken:	Discuss and amend the provisions on cables in subsection 9.2.2.2.1
Reference document:	ECE/TRANS/WP.15/230 (paragraphs 36-38 and Annex I), ECE/TRANS/WP.15/2015/15 (Netherlands), ECE/TRANS/WP.15/221 (paragraphs 33-34)

* In accordance with the programme of work of the Inland Transport Committee for 2016-2017, (ECE/TRANS/2016/28/Add.1 (9.1)).



Introduction

1. The Working Party decided in November 2013 at its ninety-fifth session to set up an informal working group with a mandate to evaluate the current requirements of Part 9 in relation to electrical equipment on vehicles and to consider the new requirements in the light of technical progress.
2. During the first session of the informal working group in February 2014 in Delft an agreement was reached on requirements for cables.
3. Germany also participated in this meeting, in which a revision of the requirements for cables was discussed. The requirements for cables were fundamentally revised and in the ninety-ninth session of the Working Party (November 2015) they were adopted as draft amendments to annexes A and B of ADR for entry into force on 1 January 2017.
4. The standards ISO 16750-4:2010 “Climatic loads” and ISO 16750-5:2010 “Chemical loads” are mentioned in 9.2.2.2.1 “Cables” with regard to the suitability of cables for the conditions in the area of the vehicle. Though they refer to the conditions in the area of the vehicle, a problem results from the scope of these standards.
5. ISO 16750-4:2010 and ISO 16750-5:2010 partly refer to test conditions contained in ISO 16750-1:2006. ISO 16750-1 “General” itself does not recommend to apply ISO 16750 to vehicle wiring harnesses, cables and electrical connectors, even though some environmental conditions and tests could be relevant.
6. Therefore, it is proposed to delete the reference to these standards. ISO 6722-1:2006 contains requirements for temperature and fluid resistance which are regarded as sufficient for all safety requirements.
7. Deleted text is highlighted struck through.

Proposal for amendments

8. Amend 9.2.2.2.1 to read as follows:

“9.2.2.2.1 Cables

No cable in an electrical circuit shall carry a current in excess of that for which the cable is designed. Conductors shall be adequately insulated.

~~The cables shall be suitable for the conditions in the area of the vehicle, such as temperature range and fluid compatibility conditions as given in ISO 16750 4:2010 and ISO 16750-5:2010, they are intended to be used.~~

The cables shall be in conformity with standard ISO 6722-1:2011 + Cor 01:2012 or ISO 6722-2:2013.

Cables shall be securely fastened and positioned to be protected against mechanical and thermal stresses.”

Justification

9. In the introduction of Part 1 (ISO 16750-1), it is not recommended to apply ISO 16750 to vehicle wiring harnesses, cables and electrical connectors.
10. After a thorough examination of ISO 16750-1, the concept of ISO 16750 is to assist its users in systematically defining and/or applying a set of internationally accepted environmental conditions, tests and operating requirements, which are based on the anticipated actual environment in which the equipment will be operated in and exposed to

during its life cycle. There have been several environmental factors considered in the development of the ISO 16750. And referring to the applicability to wiring harnesses, cables and electrical connectors it has to be pointed out that although some environmental conditions and tests in ISO 16750 may be relevant to vehicle wiring harnesses, cables and connectors, its scope is not sufficient to be used as a complete standard. It is therefore not recommended that ISO 16750 be directly applied to such devices and equipment.

11. Since ISO 16750-1:2006 is entitled “General”, it refers to all parts of the standard. i.e. the application of the standard is not recommended for any of its parts.

12. ISO 6722-1:2011 + Cor 01:2012 and ISO 6722-2:2013 contain requirements for fluid compatibility and temperature range compatibility. Thus, the requirement as set out in the second sentence of 9.2.2.2.1 is redundant and may be deleted.

13. Therefore, it is possible to do without ISO 16750-4:2010 and ISO 16750-5:2010. The objective of preventing risks posed by cables would still be sufficiently covered because compared to ADR 2015 and older versions, the requirements have already been tightened.

14. Section 1.1.5 of ADR, “Application of standards”, cannot be applied, since reference is made to standards that are not in contradiction to ADR but are not recommended for 9.2.2.2.1 “Cables”.
