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Item 6 (a) of the provisional agenda

Proposals for amendments to Annexes A and B of ADR: construction and approval of vehicles

Proposal for amendment by the informal working group on the electrical system of vehicles carrying dangerous goods

Transmitted by the Government of the Netherlands¹

Summary

Executive summary:	The informal working group re-evaluated and adjusted the requirements for the electrical system and dealt with additional items. Reproduced in this document are the proposals for amendment based on the work done.
Action to be taken:	Adoption of the proposals.
Related documents:	Informal documents INF.4 (ninety-sixth session of the Working Party), INF.5 (ninety-eighth session of the Working Party)

Introduction

1. During the third session of the informal working group agreement was reached on the following amendments. In a limited number of cases where requirements were proposed

¹ In accordance with the programme of work of the Inland Transport Committee for 2014-2015 (ECE/TRANS/240, para. 100, ECE/TRANS/2014/23, cluster 9, para.9.1).

for types of vehicles which had not previously needed to be applied were placed in square brackets for decision by the Working Party.

2. The report of the third session will be forwarded separately.
3. Three issues are intertwined in this proposal for amendment. These are:
 - revision of the requirements for the electrical system;
 - a new and more logical grouping of the requirements for the electrical system; and
 - harmonization and simplification of vehicle requirements which resulted in the deletion of “OX vehicles”.
4. It should be borne in mind that a number of issues of these proposals for amendment have a high urgency for adoption in ADR 2017. This is specially the case for the new 9.2.2.6 “Electrical connections” and 9.2.2.7 “Voltage”.
5. Below the proposals are given grouped in parts, each part containing proposals for a particular chapter of ADR. For parts 1 to 4 where existing wording is used to clarify the amendments, the existing wording is given in *Italic* print, new wording in **bold print underlined** and deleted wording ~~stricken through~~. Part 5 to 7 contains a complete set of revised wording and no difference is made in the print.

Proposals

Part 1 - Chapter 1.6

Introduce a new transitional measure in 1.6.5 to read:

1.6.5.16 **Vehicles first registered or entering into service before 1 April 2018 in accordance with the regulation in force up to 31 December 2016 that do not comply with subsection 9.2.2.8.5 or standard EN 6722 for cables of subsection 9.2.2.2.1 may continue to be used.**

1.6.5.17 **Vehicles first registered or entering into service before 1 April 2018 approved specifically as vehicle type OX may continue to be used for the carriage of substances of entry UN 2015.**

Part 2 – Chapter 3.2

Proposal 2.1

Replace “OX” by “FL” in column 14 in Table A of Chapter 3.2 for UN 2015, 2 times.

Part 3 – Chapter 7.4

Proposal 3.1

Amend the third sentence of 7.4.1 to read:

*The vehicles, whether they be rigid vehicles, drawing vehicles, trailers or semi-trailers, shall satisfy the relevant requirements of Chapters 9.1, 9.2 and ~~9.7.2~~ **9.7** concerning the vehicle to be used, as indicated in Column (14) of Table A in Chapter 3.2.*

Proposal 3.2

Amend subsection 7.4.2 to read:

7.4.2 *The vehicles designated by the codes EX/III, FL, ~~OX~~ or AT in 9.1.1.2 shall be used as follows:*

- *Where an EX/III vehicle is prescribed, only an EX/III vehicle may be used;*
- *Where a FL vehicle is prescribed, only an FL vehicle may be used;*
- ~~- *Where a OX vehicle is prescribed, only an OX vehicle may be used;*~~
- *Where an AT vehicle is prescribed, AT and FL ~~and OX~~ vehicles may be used.*

Part 4 – Chapter 9.1**Proposal 4.1**

Introduce a new little (d) to the vehicle category “FL vehicle” in subsection 9.1.1.2 to read:

(d) A vehicle intended for the carriage of hydrogen peroxide, stabilized or hydrogen peroxide, aqueous solution stabilized with more than 60% hydrogen peroxide (Class 5.1, UN No. 2015) in fixed tanks or demountable tanks with a capacity exceeding 1 m³ or in tank-containers or portable tanks with an individual capacity exceeding 3 m³;

Proposal 4.2

Delete the vehicle category “OX vehicle” in subsection 9.1.1.2.

Proposal 4.3

Amend the vehicle category “AT vehicle” in subsection 9.1.1.2 (a) to read:

"AT vehicle" means:

- (a) *A vehicle, other than EX/III, or FL ~~or OX~~ vehicle or than a MEMU, intended for the carriage of dangerous goods in fixed tanks or demountable tanks with a capacity exceeding 1 m³ or in tank-containers, portable tanks or MEGCs with an individual capacity exceeding 3 m³; or*
- (b)...

Proposal 4.4

Amend the definition of “ADR approval” in subsection 9.1.1.2 to read:

"ADR approval" means certification by a competent authority of a Contracting Party that a single vehicle intended for the carriage of dangerous goods satisfies the relevant technical requirements of this Part as an EX/II, EX/III, FL, ~~OX~~, or AT vehicle or as a MEMU.

Proposal 4.5

Amend the wording “EX/II, EX/III, FL, OX and AT vehicles and MEMUs” to read “EX/II, EX/III, FL and AT vehicles and MEMUs” in:

- the heading of section 9.1.2;
- the Note to 9.1.2;

- the first sentence of section 9.1.2.1;
- the first sentence of 9.1.2.3; and
- the first sentence of 9.1.3.1.

Proposal 4.6

Delete “OX” under item 7 of the Model certificate of approval of subsection 9.1.3.5.

Part 5 Chapter 9.2**Proposal 5.1**

Amend in the first and second paragraph of subsection 9.2.1.1 “EX/II, EX/III, FL, OX and AT vehicles and MEMUs” to read “EX/II, EX/III, FL and AT vehicles and MEMUs”.

Proposal 5.2

Replace the table of subsection 9.2.1.1 by the following table:

TECHNICAL SPECIFICATIONS		VEHICLES				COMMENTS
		EX/II	EX/III	AT	FL	
9.2.2	ELECTRICAL EQUIPMENT					
9.2.2.1	General provisions	X	X	X	X	
9.2.2.2.1	Wiring	X	X	X	X	
9.2.2.2.2	Additional protection	[X ^k]	X	[X ^j]	X	^k Applicable for vehicles with a maximum mass exceeding 3.5 tons first registered (or which entered into service if registration is not mandatory) after 1 April 2018. ^j Applicable for vehicles first registered (or which entered into service if registration is not mandatory) after 1 April 2018.
9.2.2.3	Fuses and circuit breakers	[X ^j]	X	X	X	^j Applicable for vehicles first registered (or which entered into service if registration is not mandatory) after 1 April 2018.
9.2.2.4	Batteries	X	X	X	X	
9.2.2.5	Lighting	X	X	X	X	
9.2.2.6	Electrical connections	X ^f	X	X ^j	X	^f Applicable for motor vehicles intended to draw trailers with a maximum mass exceeding 3.5 tons and trailers with a maximum mass of exceeding 3.5 tons first registered (or which entered into service if registration is not mandatory) after 1 April 2018. ^j Applicable for vehicles first registered (or which entered into service if registration is not mandatory) after 1 April 2018.
9.2.2.7	Voltage	X	X	X	X	
9.2.2.8	Battery master switch		X		X	
9.2.2.9	Permanently energized circuits					
9.2.2.9.1					X	
9.2.2.9.2			X			

9.2.3	BRAKING EQUIPMENT					
9.2.3.1	General provisions	X	X	X	X	
	Anti-lock braking system	X ^f	X ^b	X ^b	X ^b	<p>^b Applicable to motor vehicles (tractors and rigid vehicles) with a maximum mass exceeding 16 tonnes and motor vehicles authorized to tow trailers (i.e. full-trailers, semi-trailers and centre axle-trailers) with a maximum mass exceeding 10 tonnes. Motor vehicles shall be equipped with a category 1 anti-lock braking system.</p> <p>Applicable to trailers (i.e. full-trailers, semi-trailers and centre axle-trailers) with a maximum mass exceeding 10 tonnes. Trailers shall be equipped with a category A anti-lock braking system.</p> <p>^f Applicable to all motor vehicles and applicable to trailers with a maximum mass exceeding 3.5 tons, first registered (or which entered into service if registration is not mandatory) after 1 April 2018.</p>
	Endurance braking system	X ^g	X ^c	X ^c	X ^c	<p>^c Applicable to motor vehicles with a maximum mass exceeding 16 tonnes or authorized to tow a trailer with a maximum mass exceeding 10 tonnes. The endurance braking system shall be of type IIA.</p> <p>^g Applicable to motor vehicles with a maximum mass exceeding 16 tonnes or authorized to tow a trailer with a maximum mass exceeding 10 tonnes first registered after 1 April 2018. The endurance braking system shall be of type IIA.</p>
9.2.4	PREVENTION OF FIRE RISKS					
9.2.4.3	Fuel tanks	X	X		X	
9.2.4.4	Engine	X	X		X	
9.2.4.5	Exhaust system	X	X		X	
9.2.4.6	Vehicle endurance braking	X ^g	X	X	X	^g Applicable to motor vehicles with a maximum mass exceeding 16 tonnes or authorized to tow a trailer with a maximum mass exceeding 10 tonnes first registered after 1 April 2018. The endurance braking system shall be of type IIA.
9.2.4.7	Combustion heaters					
9.2.4.7.1 9.2.4.7.2 9.2.4.7.5		X ^d	X ^d	X ^d	X ^d	^d Applicable to motor vehicles equipped after 30 June 1999. Mandatory compliance by 1 January 2010 for vehicles equipped before 1 July 1999. If the date of equipping is not available the date of first registration of the vehicle shall be used instead.
9.2.4.7.3 9.2.4.7.4					X ^d	^d Applicable to motor vehicles equipped after 30 June 1999. Mandatory compliance by 1 January 2010 for vehicles equipped before 1 July 1999. If the date of equipping is not available the date of first registration of the

						vehicle shall be used instead.
9.2.4.7.6		X	X			
9.2.5	SPEED LIMITING DEVICES	X ^e	X ^e	X ^e	X ^e	^e Applicable to motor vehicles with a maximum mass exceeding 12 tonnes first registered after 31 December 1987, and all motor vehicles with a maximum mass exceeding 3.5 tonnes but not more than 12 tonnes registered after 31 December 2007.
9.2.6	COUPLING DEVICES FOR TRAILERS	X	X	X ^h	X ^h	^h Applicable to coupling devices of trailers and motor vehicles first registered (or which entered into service if registration is not mandatory) after 1 April 2018.

Proposal 5.3

Replace the existing wording of section 9.2.2 by the following:

“9.2.2 Electrical equipment

9.2.2.1 General provisions

The installation shall be so designed, constructed and protected that it cannot provoke any unintended ignition or short-circuit under normal conditions of use of vehicles.

The electrical installation as a whole shall meet the provisions of 9.2.2.2 to 9.2.2.9 in accordance with the table of 9.2.1.

9.2.2.2 Wiring

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 16750-1:2006 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.

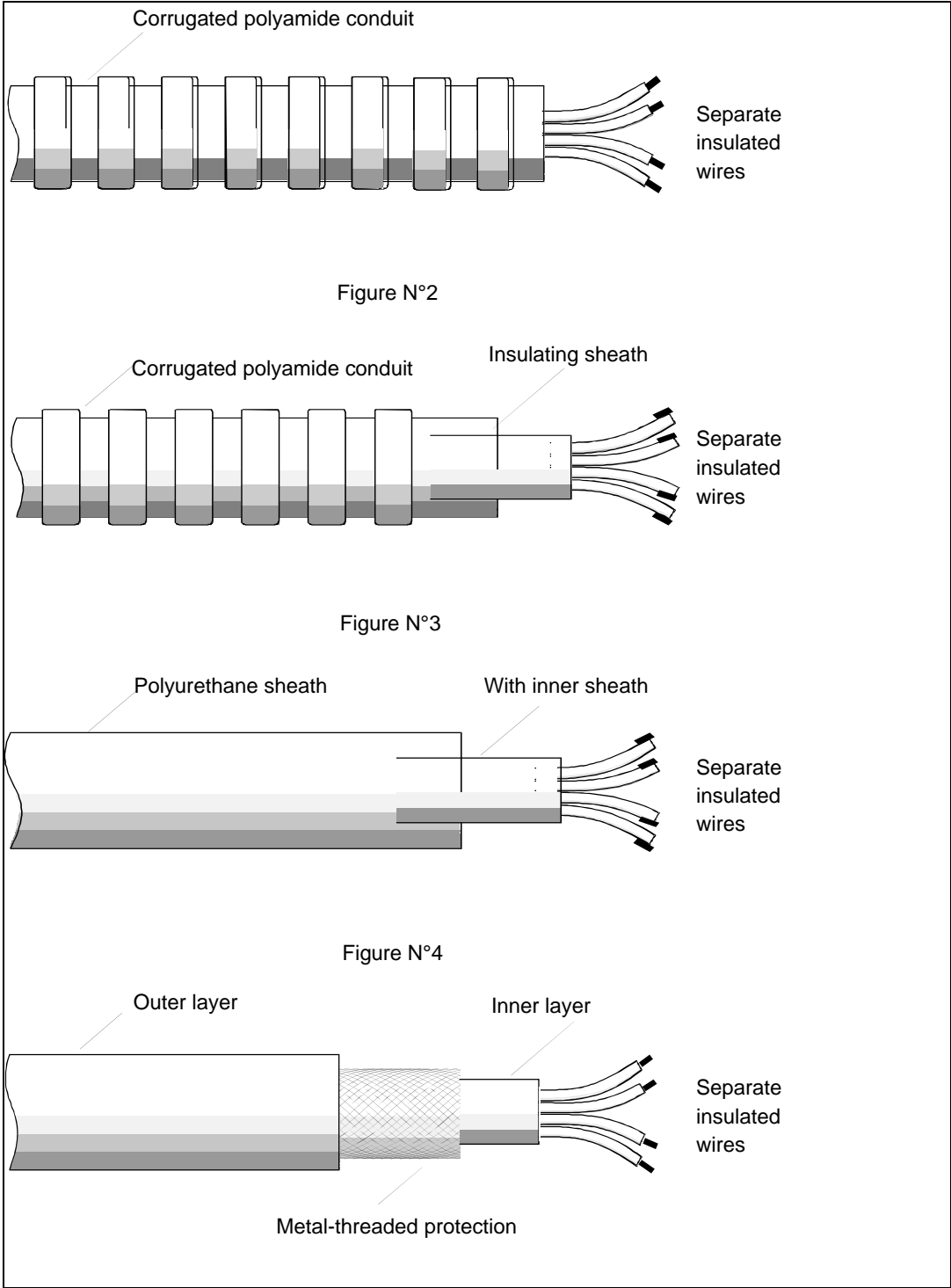
Cables shall be securely fastened and positioned to be protected against mechanical and thermal stresses.

9.2.2.2.2 Additional protection

Cables located to the rear of the driver's cab and on trailers shall be additionally protected to minimize any unintended ignition or short-circuit in the event of an impact or deformation.

The additional protection shall be suitable for the conditions during normal use of the vehicle.

The additional protection is complied with if multicore cables in conformity with ISO 14572:2011 are used or one of the examples in figures 1 to 4 below or another configuration that offers equally effective protection.



Cables of wheel speed sensors do not need additional protection.

[EX/II vehicles being one stage built panel vans where the wiring behind the driver’s cab is protected by the body are deemed to comply with this requirement.]

9.2.2.3 Fuses and circuit breakers

All circuits shall be protected by fuses or automatic circuit

breakers, except for 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.

The above unprotected circuits shall be as short as possible.

9.2.2.4 Batteries

Battery terminals shall be electrically insulated or the battery shall be covered by an insulating cover.

Batteries which may develop ignitable gas and are not located under the engine bonnet, shall be fitted in a vented box.

9.2.2.5 Lighting

Light sources with a screw cap shall not be used.

9.2.2.6 Electrical connections

9.2.2.6.1

Electrical connections between motor vehicles and trailers shall be designed to prevent:

- ingress of moisture and dirt; the connected parts shall have a protection degree of at least IP 54 in accordance with IEC 60529,
- accidental disconnection; connectors shall fulfil the requirements given in clause 5.6 of ISO 4091:2003.

9.2.2.6.2

Requirements of 9.2.2.6.1 are deemed to be met:

- for connectors standardized for specific purposes according to ISO 12098:2004²³, ISO 7638:2003²³, EN 15207:2014²³ or ISO 25981:2008²³
- where the electrical connections are part of an automatic coupling system (see ECE Regulation No.55).

9.2.2.6.3

Electrical connections for other purposes concerning the proper functioning of the vehicles or their equipment may be used provided they comply with the requirements of 9.2.2.6.1.

9.2.2.7 Voltage

The nominal voltage of the electrical system shall not exceed 25V A.C. or 60V D.C.

Higher voltages are allowed in galvanically isolated parts of the electrical system provided those parts are not located within a perimeter of at least 0.5 metres from the outside of the load compartment or tank.

²³ ISO 4009, referred to in this standard, need not be applied.

Additionally systems working on a voltage higher than 1000V A.C. or 1500V D.C. shall be integrated in an enclosed housing.

If Xenon lights are used only those having integrated starters are allowed.

9.2.2.8 Battery master switch

9.2.2.8.1 A switch for breaking the electrical circuits shall be placed as close to the battery as practicable. If a single pole switch is used it shall be placed in the supply lead and not in the earth lead.

9.2.2.8.2 A control device to facilitate the disconnecting and reconnecting functions of the switch shall be installed in the driver's cab. It shall be readily accessible to the driver and be distinctively marked. It shall be protected against inadvertent operation by either adding a protective cover, by using a dual movement control device or by other suitable means. Additional control devices may be installed provided they are distinctively marked and protected against inadvertent operation. If the control device(s) are electrically operated, the circuits of the control device(s) are subject to the requirements of 9.2.2.9.

9.2.2.8.3 The switch shall break the circuits within 10 seconds after activation of the control device.

9.2.2.8.4 The switch shall have a casing with protection degree IP 65 in accordance with IEC Standard 60529.

9.2.2.8.5 The cable connections on the switch shall have protection degree IP 54 in accordance with IEC 60529. However, this does not apply if these connections are contained in a housing which may be the battery box. In this case it is sufficient to insulate the connections against short circuits, for example with a rubber cap.

9.2.2.9 Permanently energized circuits

9.2.2.9.1 (a) Those parts of the electrical installation including the leads which shall remain energized when the battery master switch is open, shall be suitable for use in hazardous areas. Such equipment shall meet the general requirements of IEC 60079, parts 0 and 14² and the additional requirements applicable from IEC 60079, parts 1, 2, 5, 6, 7, 11, 15 or 18;

(b) For the application of IEC 60079 part 14¹, the following classification shall be used:

Permanently energized electrical equipment including the leads which is not subject **to 9.2.2.4 and 9.2.2.8** shall meet the requirements for Zone 1 for electrical equipment in general or meet the requirements for Zone 2 for electrical equipment situated in the driver's cab. The requirements for explosion group IIC, temperature class T6 shall be met.

However, for permanently energized electrical equipment installed in an environment where the temperature caused by non-electrical equipment situated in that environment exceeds the T6 temperature limit, the temperature classification of the permanently energized electrical equipment shall be at least that of the T4 temperature class.

² *The requirements of IEC 60079 part 14 do not take precedence over the requirement of this Part.*

(c) The supply leads for permanently energised equipment shall either comply with the provisions of IEC 60079, part 7 ("Increased safety") and be protected by a fuse or automatic circuit breaker placed as close to the source of power as practicable or, in the case of "intrinsically safe equipment", they shall be protected by a safety barrier placed as close to the source of power as practicable.

9.2.2.9.2 Bypass connections to the battery master switch for electrical equipment which must remain energized when the battery master switch is open shall be protected against overheating by suitable means, such as a fuse, a circuit breaker or a safety barrier (current limiter).”.

Proposal 5.4

Delete subsection 9.2.4.2 and replace wording by “Deleted”

Proposal 5.5

Replace the wording of section 9.2.6 by:

“9.2.6 Coupling devices for trailers

Coupling devices of trailers and drawing vehicles shall comply with the technical requirements of ECE Regulation No. 55⁶ as amended, in accordance with the dates of application specified therein.”.

Part 6 - Chapter 9.3

Proposal 6.1

Replace the existing section 9.3.7 with the following wording:

“9.3.7 Electrical equipment

9.3.7.1 The electrical installation shall meet the relevant requirements of 9.2.2.1, 9.2.2.2 9.2.2.3, 9.2.2.4, 9.2.2.5, 9.2.2.6, 9.2.2.7, 9.2.2.8 and 9.2.2.9.1.

9.3.7.2 The electrical installation in the load compartment shall be dust-protected at least IP 54 according to IEC 60529 or equivalent. In the case of carriage of items and articles of compatibility group J, protection to at least IP 65 according to IEC 60529 or equivalent shall be provided.

9.3.7.3 No wiring shall be positioned inside the load compartment. Electrical equipment accessible from the inside of the load compartment shall be sufficiently protected from mechanical impact from the inside.”.

Part 7 -Chapter 9.7

Proposal 7.1

Amend in the heading of Chapter 9.7 “EX/III, FL, OX and AT vehicles” to read “ EX/III, FL and AT vehicles”:

Proposal 7.2

Amend the first sentence of subsection 9.7.8.1 to read:

“The electrical installation on FL vehicles shall meet the relevant requirements of 9.2.2.1, 9.2.2.2, 9.2.2.4, 9.2.2.5, 9.2.2.6, 9.2.2.8 and 9.2.2.9.1.

Part 8- table of contents of Volume II of ADR

Replace in the table of contents 9.2.6 by:

“9.2.6 Coupling devices for trailers”.
