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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on General Safety Provisions****110<sup>th</sup> session**

Geneva, 26–29 April 2016

Item 11 of the provisional agenda

**Regulation No. 105 (ADR vehicles)****Proposal for the 06 series of amendments to Regulation  
No. 105 (ADR vehicles)****Note by the secretariat \***

The text reproduced below was prepared by the secretariat to align the provisions of UN Regulation No. 105 with those of the new 2017 edition of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). The modifications to the current text of UN Regulation No. 105 are marked in bold for new characters and strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



## I. Proposal

Paragraph 3.2.2., amend to read:

"3.2.2. Vehicle designation, according to paragraph 9.1.1.2. of the ADR (EX/II, EX/III, AT, FL, ~~OX~~, MEMU);"

Paragraph 5.1., the table, amend to read:

"

Technical specifications		Vehicle designation (according to chapter 9.1 of Annex b to ADR)				
		EX/II	EX/III	AT	FL	<del>OX</del>
5.1.1.	Electrical equipment					
<del>5.1.1.2.1.</del>	<del>Wiring</del> <b>General provisions</b>		X	X	X	<del>X</del>
<b>5.1.1.2.1.</b>	<b>Cables</b>	X	X	X	X	
<b>5.1.1.2.2.</b>	<b>Additional protection</b>	X	X	X	X	
<b>5.1.1.3.</b>	<b>Fuses and circuit breakers</b>	X	X	X	X	
<del>5.1.1.3.</del>	<del>Battery master switch</del>					
<del>5.1.1.3.1.</del>			<del>X</del>		<del>X</del>	
<del>5.1.1.3.2.</del>			<del>X</del>		<del>X</del>	
<del>5.1.1.3.3.</del>					<del>X</del>	
<del>5.1.1.3.4.</del>			<del>X</del>		<del>X</del>	
5.1.1.4.	Batteries	X	X	X	X	
<del>5.1.1.5.</del>	<del>Permanently energized circuits</del>					
<del>5.1.1.5.1.</del>	<del>Lighting</del>	X	X	X	X	
<del>5.1.1.5.2.</del>			<del>X</del>			
5.1.1.6.	Electrical installation at the rear of the cab connections	X	X	X	X	
<b>5.1.1.7.</b>	<b>Voltage</b>	X	X			
<b>5.1.1.8.</b>	<b>Battery master switch</b>		X		X	
<b>5.1.1.9.</b>	<b>Permanently energized circuits</b>					
<b>5.1.1.9.1.</b>					X	
<b>5.1.1.9.2.</b>			X			
<b>5.1.2.</b>	<b>Braking equipment</b>					
<b>5.1.2.1.</b>		X	X	X	X	

Technical specifications		Vehicle designation (according to chapter 9.1 of Annex b to ADR)				
		EX/II	EX/III	AT	FL	ØX
5.1.2.2.		X	X	X	X	
5.1.2.3.	Prevention of fire risks					
<del>5.1.2.2.</del>	<del>Vehicle cab</del>					ØX
5.1.2.3.2.	Fuel tanks	X	X		X	ØX
5.1.2.4.3.3.	Engine	X	X		X	ØX
5.1.2.5.3.4.	Exhaust system	X	X		X	
5.1.2.6.3.5.	Vehicle endurance braking		X	X	X	ØX
5.1.2.7.3.6.	Combustion heaters					
5.1.2.7.1.3.6.1		X	X	X	X	ØX
<del>5.1.3.</del>	<del>Braking equipment</del>	ØX	ØX	ØX	ØX	ØX
<del>5.1.3.1.</del>			ØX	ØX	ØX	ØX
<del>5.1.3.2.</del>		ØX				
5.1.4	Speed limitation device	X	X	X	X	ØX
5.1.5.	Coupling devices for of motor vehicles and trailers	X	X	X	X	
5.1.6.	Prevention of other risks caused by fuels			X	X	

"

Paragraph 5.1.1.1., amend to read:

"5.1.1.1. General provisions

~~The electrical installation as a whole shall meet the following provisions, in accordance with the table of paragraph 5.1. 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 paragraphs 5.1.1.2. to 5.1.1.9. in accordance with the table of paragraph 5.1."**

Insert new paragraphs 5.1.1.2.1. and 5.1.1.2.2., to read:

"5.1.1.2.1. 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.

**5.1.1.2.2. 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 is used.

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."

*Paragraph 5.1.1.2.1. (former), renumber as paragraph 5.1.1.3. and amend to read:*

**"5.1.1.3. Fuses and circuit breakers**

~~The size of conductors shall be large enough to avoid overheating. Conductors shall be adequately insulated.~~ All circuits shall be protected by fuses or automatic circuit breakers, except for the following:

- (a) From the **starter** battery to the cold start and stopping systems of the engine.
- (b) From the **starter** battery to the alternator.
- (c) From the alternator to the fuse or circuit breaker box.
- (d) From the **starter** battery to the starter motor.
- (e) From the **starter** battery to the power control housing of the endurance braking system (see **paragraph 5.1.2.1.**), if this system is electrical or electromagnetic.
- (f) From the **starter** battery to the electrical lifting mechanism for lifting the bogie axle.

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

*Paragraph 5.1.1.2.2. (former), shall be deleted.*

*Paragraph 5.1.1.4., amend to read:*

**"5.1.1.4. Batteries**

~~The~~ **Battery** terminals shall be electrically insulated or **the battery shall be** covered by ~~the an~~ insulating ~~battery box~~ cover. ~~If the Batteries which may~~

**develop ignitable gas and** are not located under the engine bonnet, ~~they~~ shall be fitted in a vented box."

*Paragraphs 5.1.1.6.2. and 5.1.1.6.3. (former), renumber as paragraphs 5.1.1.5. and 5.1.1.6. and amend to read:*

**"5.1.1.5. Lighting**

Lamp **sources** with a screw cap shall not be used.

**5.1.1.6. Electrical connections between motor vehicles and trailers**

**5.1.1.6.1. Electrical connections ~~between motor vehicles and trailers~~ shall be designed to prevent:**

- (a) **Ingress of moisture and dirt; the connected parts** shall have a protection degree **of at least IP54** in accordance with IEC ~~standard 60529 and be designed to prevent~~
- (b) Accidental disconnection; connectors shall ~~be in conformity with~~ **fulfil the requirements given in clause 5.6. of ISO 4091:2003.**

**5.1.1.6.2. Requirements of paragraph 5.1.1.6.1. are deemed to be met:**

- (a) **For connectors standardized for specific purposes accord to ISO 25981:2008<sup>5</sup>, ISO 12098:2004<sup>5</sup>, ISO 7638:2003<sup>5</sup>, and EN 15207:2006 EN 15207:2014<sup>5</sup> or ISO 25981:2008<sup>5</sup> as appropriate.**
- (b) **Where the electrical connections are part of an automatic coupling system (see Regulation No. 55).**

<sup>5</sup> ISO 4009, referred to in this standard, need not be applied."

*Insert a new paragraph 5.1.1.6.3., to read:*

**"5.1.1.6.3. 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 paragraph 5.1.1.6.1."**

*Insert a new paragraph 5.1.1.7., to read:*

**"5.1.1.7. 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.**

**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."**

*Paragraphs 5.1.1.3. to 5.1.1.3.2. (former), renumber as paragraphs 5.1.1.8. to 5.1.1.8.2. and amend to read:*

- "**5.1.1.8.** Battery master switch
- 5.1.1.8.1.** 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.
- 5.1.1.8.2.** A control device to facilitate the disconnecting and the reconnecting functions of the switch shall be installed in the driver's cab. It shall be readily accessible to the driver and 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 paragraph ~~5.1.1.5.~~ **5.1.1.9.**"

*Insert a new paragraph 5.1.1.8.3., to read:*

- "**5.1.1.8.3.** **The switch shall break the circuits within 10 seconds after activation of the control device.**"

*Former paragraphs 5.1.1.3.3. and 5.1.1.3.4., renumber as paragraphs 5.1.1.8.4. and 5.1.1.8.5. and amend to read:*

- "**5.1.1.8.4.** The switch shall have a casing with protection degree IP65 in accordance with IEC Standard 60529.
- 5.1.1.8.5.** The cable connections on the battery master switch shall have a protection degree IP54 **in accordance with IEC Standard 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."

*Former paragraphs 5.1.1.5. to 5.1.1.5.2., renumber as paragraphs 5.1.1.9. to 5.1.1.9.2. and amend to read:*

- "**5.1.1.9.** Permanently energized circuits
- 5.1.1.9.1.** (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 ~~appropriate~~ **general** requirements of IEC 60079<sup>4</sup>, parts 0 and 14 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 14, the following classification shall be used:
- Permanently energized electrical equipment including the leads ~~that~~ **which** are not subject to paragraphs ~~5.1.1.3. and 5.1.1.4.~~ **and 5.1.1.8.** shall meet the requirements for ~~zone~~ **Zone 1** for electrical equipment in general or meet the requirements for ~~zone~~ **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.**

- (c) The supply leads for permanently energized 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.

**5.1.1.9.2.** 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).

<sup>4</sup> The requirements of IEC 60079 part 14 do not take precedence over the requirements of this Regulation."

*Paragraphs 5.1.1.6. and 5.1.1.6.1., shall be deleted.*

*Paragraphs 5.1.3. to 5.1.3.2. (former), renumber as paragraphs 5.1.2. to 5.1.2.2. and amend to read:*

**"5.1.2.** Braking equipment

**5.1.2.1.** EX/III, AT, FL, ~~OX~~ and MEMU vehicles shall fulfil all relevant requirements of Regulation No. 13, including those of Annex 5.

**5.1.2.2.** EX/II vehicles shall fulfil all relevant requirements of Regulation No. 13. Nevertheless, the requirements of Annex 5 are not applicable."

*Paragraphs 5.1.2. and 5.1.2.1. (former), renumber as paragraphs 5.1.3. and 5.1.3.1.*

*Paragraph 5.1.2.2. (former), shall be deleted.*

*Paragraphs 5.1.2.3. and 5.1.2.3.1. (former), renumber as paragraph 5.1.3.2. and amend to read:*

**"5.1.3.2.** Fuel tanks **and cylinders**

The fuel tanks **and cylinders** ~~for~~ supplying the engine of the vehicle shall meet the following requirements:

- ~~5.1.2.3.1.~~ **(a)** In the event of any leakage **under normal conditions of carriage**, the **liquid fuel or the liquid phase of a gaseous fuel**, shall drain to the ground ~~without coming~~ **and not come** into contact with **the load or** hot parts of the vehicle ~~or with a closure enabling the opening to be kept hermetically sealed.~~
- (b)** **Fuel tanks for liquid fuels shall meet the requirements of Regulation No. 34; fuel tanks containing petrol shall be equipped with an effective flame trap at the filler opening or with a closure enabling the opening to be kept hermetically sealed. Fuel tanks and cylinders for LNG and for CNG respectively shall meet the relevant requirements of Regulation No. 110. Fuel tanks for LPG shall meet the relevant requirements of Regulation No. 67.**
- (c)** **The discharge opening(s) of pressure relief devices and/or pressure relief valves of fuel tanks containing gaseous fuels shall be directed**

away from air intakes, fuel tanks, the load or hot parts of the vehicle and shall not impinge on enclosed areas, other vehicles, exterior-mounted systems with air intake (i.e. air-conditioning systems), engine intakes, or engine exhaust. Pipes of the fuel system shall not be fixed on the shell containing the load."

*Paragraph 5.1.2.3.2. (former), shall be deleted.*

*Paragraph 5.1.2.4. (former), renumber as paragraph 5.1.3.3. and amend to read:*

**"5.1.3.3. Engine**

The engine propelling the vehicle shall be so equipped and situated to avoid any danger to the load through heating or ignition. **The use of CNG or LNG as fuel shall be permitted only if the specific components for CNG and LNG are approved according to Regulation No. 110 and meet the provisions of paragraph 5.1.1. The installation on the vehicle shall meet the technical requirements of paragraph 5.1.1. and Regulation No. 110. The use of LPG as fuel shall be permitted only if the specific components for LPG are approved according to Regulation No. 67 and meet the provisions of paragraph 5.1.1. The installation on the vehicle shall meet the technical requirements of paragraph 5.1.1. and Regulation No. 67.** In the case of EX/II, **and EX/III and MEMU** vehicles, the engine shall be of compression-ignition **construction using only liquid fuels with a flashpoint above 55 °C. Gases shall not be used.**"

*Paragraphs 5.1.2.5. to 5.1.2.7.1. (former), renumber as paragraphs 5.1.3.4. to 5.1.3.6.1.*

*Paragraph 5.1.5., amend to read:*

**"5.1.5. Coupling devices ~~for~~ of motor vehicles and trailers**

Coupling devices ~~for~~ of motor vehicles and trailers shall comply with the technical requirements of Regulation No. 55."

*Insert new paragraphs 5.1.6. and 5.1.6.1., to read:*

**"5.1.6. Prevention of other risks caused by fuels**

**5.1.6.1. Fuel systems for engines fuelled by LNG shall be so equipped and situated to avoid any danger to the load due to the gas being refrigerated."**

*Paragraphs 10. to 10.4., amend to read:*

**"10. Transitional provisions**

10.1. As from the official date of entry into force of the ~~05~~ **06** series of amendments, no Contracting Party applying this Regulation shall refuse to grant ECE approval under this Regulation as amended by the ~~05~~ **06** series of amendments.

10.2. As from 1 April ~~2012~~ **2018**, Contracting Parties applying this Regulation shall grant ECE approvals only if the vehicle type to be approved meets the requirements of this Regulation as amended by the ~~05~~ **06** series of amendments.

10.3. Contracting Parties applying this Regulation shall continue to grant approvals and extensions of such approvals to those types of vehicle which comply with



the requirements of this Regulation, as amended by the preceding series of amendments until 31 March ~~2012~~ **2018**.

- 10.4. No Contracting Party applying this Regulation shall refuse national or regional type approval of a vehicle type approved to the ~~05 06~~ series of amendments to this Regulation."

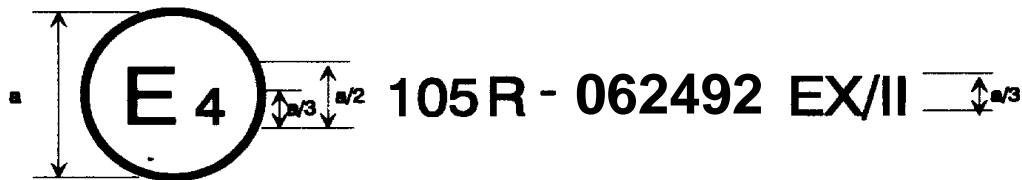
Annex 1, item 4, amend to read:

"4. Vehicle designation (EX/II, EX/III, FL, ~~OX~~, AT, MEMU):....."

Annex 2, amend to read:

### "Arrangements of approval marks

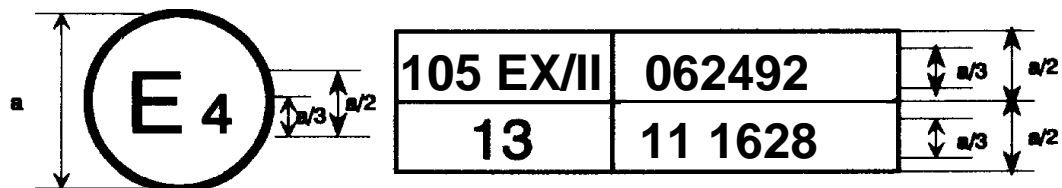
Model A  
(see paragraph 4.4. of this Regulation)



a = 8 mm min.

The above approval mark affixed to a vehicle shows that the vehicle type concerned, intended for the transport of dangerous goods, has been approved in the Netherlands (E 4), pursuant to Regulation No. 105, under the approval number ~~052492~~ **062492** and designated EX/II (according to paragraph 9.1.1.2. of Annex B to the ADR). The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. 105 as amended by the ~~05 06~~ series of amendments.

Model B  
(see paragraph 4.5. of this Regulation)



a = 8 mm min.

The above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in the Netherlands (E 4) pursuant to Regulations Nos. 105 and 13<sup>1</sup>. The first two digits of the approval numbers indicate that, at the dates when respective approvals were granted, Regulation No. 105, as amended by the ~~05 06~~ series of amendments, while Regulation No. 13 already included the 11 series of amendments.

<sup>1</sup> The second Regulation number is given merely as an example."

## II. Justification

1. Following the decision of the Working Party on the Transport of Dangerous Goods (WP.15), the UNECE secretariat has been tasked with producing a consolidation of all the changes agreed for ADR 2017 in time for its May 2016 session (see report ECE/TRANS/WP.15/230, Annex I). The amendments agreed by WP.15 will be posted on the UNECE website as document ECE/TRANS/WP.15/231.

2. This document aims to align the provisions of UN Regulation No. 105 with those of the new ADR 2017 edition. The changes to Chapter 9.1. are largely editorial, but do include some changes of substance (see pages 15-21 of report ECE/TRANS/WP.15/230), therefore the amendment to UN Regulation No. 105 has to reflect that accordingly.

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