

23 November 2023

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## Agreement

### **Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations\***

(Revision 3, including the amendments which entered into force on 14 September 2017)

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#### **Addendum 104 – UN Regulation No. 105**

#### **Revision 3 – Amendment 2**

Supplement 2 to the 06 series of amendments – Date of entry into force: 24 September 2023

### **Uniform provisions concerning the approval of vehicles intended for the carriage of dangerous goods with regard to their specific constructional features**

This document is meant purely as documentation tool. The authentic and legal binding texts is: ECE/TRANS/WP.29/2023/20.



**UNITED NATIONS**

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\* Former titles of the Agreement:  
Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958 (original version);  
Agreement concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions, done at Geneva on 5 October 1995 (Revision 2).

Paragraph 5.1., amend to read:

"5.1. Vehicles shall, depending on the vehicle designation, comply with the provisions below as assigned in the table overleaf.<sup>3</sup>

For the purpose of this UN Regulation, MEMU vehicles shall comply with the requirements applicable to EX/III vehicles.

Vehicles approved as being in compliance with the requirements applicable to EX/III under this Regulation, as amended by the 06 series of amendments, shall be deemed to comply with the requirements applicable to MEMU vehicles.

<i>Technical specifications</i>	<i>Vehicle designation (according to chapter 9.1 of Annex b to ADR)</i>				
	EX/II	EX/III	AT	FL	-
5.1.1. Electrical equipment					
5.1.1.1. General provisions	X	X	X	X	-
5.1.1.2.1. Cables	X	X	X	X	-
5.1.1.2.2. Additional protection	X	X	X	X	-
5.1.1.3. Fuses and circuit breakers	X	X	X	X	-
5.1.1.4. Batteries	X	X	X	X	-
5.1.1.5. Lighting	X	X	X	X	-
5.1.1.6. Electrical connections	X	X	X	X	-
5.1.1.7. Voltage	X	X			-
5.1.1.8. Battery master switch		X		X	-
5.1.1.9. Permanently energized circuits					
5.1.1.9.1.				X	-
5.1.1.9.2.		X			-
5.1.2. Braking equipment					
5.1.2.1.	X	X	X	X	-
5.1.3. Prevention of fire risks					
5.1.3.2. Fuel tanks	X	X		X	-
5.1.3.3. Engine	X	X		X	-
5.1.3.4. Exhaust system	X	X		X	-
5.1.3.5. Electric power train			X		
5.1.3.6. Vehicle endurance braking	X	X	X	X	-
5.1.3.7. Combustion heaters					

	<i>Vehicle designation (according to chapter 9.1 of Annex b to ADR)</i>				
	EX/II	EX/III	AT	FL	-
<i>Technical specifications</i>					
5.1.3.7.1	X	X	X	X	-
5.1.4. Speed limitation device	X	X	X	X	-
5.1.5. Coupling devices 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 (including the reference to new footnote <sup>4</sup>):

"5.1.1.1. 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, with the exception of the electric power train in compliance with the technical provisions of UN Regulation No. 100<sup>4</sup>, as amended at least by the 03 series of amendments, shall meet the provisions of paragraphs 5.1.1.2. to 5.1.1.9. in accordance with the table of paragraph 5.1."

*Paragraph 5.1.1.2.1.*, amend 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 they are intended to be used.

The cables shall be in conformity with standard ISO 6722-1:2011 including its Corr. 01:2012, ISO 6722-2:2013, ISO 19642-3:2019, ISO 19642-4:2019, ISO 19642-5:2019 or ISO 19642-6:2019.

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

*Paragraph 5.1.1.2.2.*, amend to read:

"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.

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<sup>4</sup> UN Regulation No. 100 (Uniform provisions concerning the approval of vehicles with regard to specific requirements for the electric power train)."

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, ISO 19642-7:2019, ISO 19642-8:2019, ISO 19642-9:2019 or ISO 19642:10:2019 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.

Figure 1

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*Paragraph 5.1.1.9.1.*, renumber the reference to footnote <sup>4</sup> to read footnote <sup>5</sup>

*Paragraph 5.1.1.6.2.*, renumber the reference to footnote <sup>5</sup> to read footnote <sup>6</sup>

*Paragraph 5.1.2.1.*, amend to read:

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

Vehicles equipped with an electric regenerative braking system shall fulfil all relevant the technical requirements of UN Regulation No. 13, as amended at least by the 11 series of amendments, as applicable."

*Paragraph 5.1.2.5.*, renumber the reference to footnote <sup>6</sup> to read footnote <sup>7</sup>

*Paragraph 5.1.3.2.*, amend to read:

"5.1.3.2. Fuel tanks and cylinders

NOTE: 5.1.3.2 likewise applies to fuel tanks and cylinders used for hybrid vehicles which include an electric power train in the mechanical driveline of the internal combustion engine or use an internal combustion engine to drive a generator to energize the electric power train.

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

- (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 and not come into contact with the load or hot parts of the vehicle.
- (b) Fuel tanks for liquid fuels shall meet the requirements of UN 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 UN Regulation No. 110. Fuel tanks for LPG shall meet the relevant requirements of UN 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 5.1.3.3.*, amend to read:

"5.1.3.3. Engine

NOTE: 5.1.3.3. likewise applies to hybrid vehicles which include an electric power train in the mechanical driveline of the internal combustion engine or use an internal combustion engine to drive a generator to energize the electric power train.

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 UN 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 UN Regulation No. 110. The use of LPG as fuel shall be permitted only if the specific components for LPG are approved according to UN 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 UN Regulation No. 67. In the case of EX/II, and EX/III vehicles, the engine shall be of compression-ignition construction using only liquid fuels with a flashpoint above 55 °C. Gases shall not be used."

*Insert new paragraph 5.1.3.5.*, to read (including the reference to new footnote <sup>8</sup>):

"5.1.3.5. Electric power train

NOTE: 5.1.3.5. likewise applies to hybrid vehicles that include an electric power train in the mechanical driveline of an internal combustion engine. Electric power trains shall not be used for EX and FL vehicles.

The electric power train shall meet the requirements of UN Regulation No. 100<sup>8</sup>, as amended at least by the 03 series of amendments. Measures shall be taken to prevent any danger to the load by heating or ignition."

*Paragraphs 5.1.3.5. to 5.1.3.6.1.(former)*, renumber as paragraphs 5.1.3.6. to 5.1.3.7.1.

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<sup>8</sup> UN Regulation No. 100 (Uniform provisions concerning the approval of vehicles with regard to specific requirements for the electric power train)."