

# Economic Commission for Europe

## Inland Transport Committee

### Working Party on the Transport of Dangerous Goods

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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**

## Issues of interpretation to the table of 9.2.1.1

Transmitted by the Government of the Netherlands

### I. Introduction

1. An interpretation problem surfaced in the table of 9.2.1.1 concerning the interaction between the crosses in the table and the contents of the requirements in the sub-sections of 9.2.4.3, 9.2.4.4 and 9.4.6.

Below the lines are reproduced.

		EX/II	EX/III	AT	FL	
<b>9.2.4</b>	<b>PREVENTION OF FIRE RISKS</b>					
9.2.4.3	Fuel tanks and cylinders	X	X		X	
9.2.4.4	Engine	X	X		X	
9.2.4.5	---					
9.2.4.6	Electric power train			X		

2. In sub-section 9.2.4.3 requirements are included to use fuel tanks and cylinders that comply with the relevant UN vehicle regulations. For example, UN Regulation No. 110 for CNG and LNG is referenced. However, for AT these are not applicable.

3. Depending on the legal system in the Contracting Parties to ADR two interpretations for the AT category are possible:

(a) There are no requirements applicable, and any fuel tank may be used if allowed to be fitted by law in the country of registration of the vehicle (in the EU this is well regulated).

(b) It is not allowed to have fuel tanks and cylinders on AT vehicles.

4. The situation is even more grave in sub-section 9.2.4.4 for the installation of the fuel system on engines. Besides the problems as above for AT vehicles, here also engines with compression-ignition systems (Diesel) are only mentioned for EX/II and EX/III vehicles. It may even be interpreted in such a way that Diesel engines are not allowed for FL vehicles.

5. For sub-section 9.2.4.6 there are issues as it only allows the electric power train for the AT category. Although a note in sub-section 9.2.4.6 makes readers aware that the electric power train is not allowed for EX/II, EX/III and FL vehicles, coming from the table as a starting point it may be explained that sub-section 9.2.4.6 does not apply including the note.

## II. Proposals

### Option 1

6. Delete the reference to the UN vehicle regulations in sub-sections 9.2.4.3 and 9.2.4.4 and return to the original additional requirements in ADR 2015 (see text under Background).

+ most pure option as the UN vehicle requirements are not specific *additional* requirements, vehicles already comply.

- Outside the EU the application of the particular UN vehicle regulations is less certain. Because the treaty has more and more contracting parties outside the EU, and ADR is inspiration for legislation in various non-contracting parties, a minimum safety level may be lost.

### Option 2

7. Also apply the X to the AT category.

+ easy solution

- also the older provisions –(fuel shall be able to drip to the ground without coming in contact with load or hot vehicle part, flame trap in filler neck for petrol, fitting the engine is such a way to prevent danger to the load by heating or ignition) will become applicable to AT vehicles as well.

- requires a transitional provision for existing AT vehicles for the requirements they had not to comply with before.

### Option 3

8. Sub-sections 9.2.4.3 and 9.2.4.4 are split up into two new sub-sections 9.2.4.3.1 and 9.2.4.3.2 respectively 9.2.4.4.1 and 9.2.4.4.2 in which the first parts retain the old provisions excluded for AT vehicles and the second part contains the newer requirements referencing the UN vehicle regulations for all 4 categories.

+ retains the exception of specific requirements for AT vehicles.

- requires a splitting up of the requirements in two sub-sections.

- may require an application note or transitional measure for existing AT vehicles that do not yet comply with the UN vehicle regulations (if these vehicles exist at all).

*Note: For sub-section 9.2.4.6 correction should be part of the discussion on Electrified Vehicles.*

## III. Background information

9. Before ADR 2017, sub-sections 9.2.4.3 and 9.2.4.4 only contained specific additional requirements to the fuel tank and vehicle engine.

Sub-sections 9.2.4.3 and 9.2.4.4 in ADR 2015:

### “9.2.4.3 Fuel tanks

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

(a) In the event of any leakage, the fuel shall drain to the ground without coming into contact with hot parts of the vehicle or the load.

(b) 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.

#### 9.2.4.4 *Engine*

The engine propelling the vehicle shall be so equipped and situated to avoid any danger to the load through heating or ignition. In the case of EX/II and EX/III vehicles the engine shall be of compression-ignition construction.”

10. With the introduction of CNG/LNG and LPG as fuel the interpretation problems were introduced. In ADR 2023 they read as follows (old wording in the subsections in *italic script*).

#### “9.2.4.3 *Fuel tanks and cylinders*

**NOTE:** 9.2.4.3 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.

#### 9.2.4.4 *Engine*

**NOTE:** 9.2.4.4 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 9.2.2. The installation on the vehicle shall meet the technical requirements of 9.2.2 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 9.2.2. The installation on the vehicle shall meet the technical requirements of 9.2.2 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.*

#### 9.2.4.6 *Electric power train*

**NOTE:** 9.2.4.6 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, 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.”