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World Forum for Harmonization of Vehicle Regulations (WP.29)

Working Party on General Safety Provisions (GRSG)  
(Seventy-eighth session, 10-14 April 2000,  
agenda item 11.2.)

**PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 105  
(vehicles intended for the carriage of dangerous goods)**

Transmitted by the secretariat

Note : The text reproduced below was prepared jointly by the secretariats of WP.15 and WP.29 in order to align Regulation No. 105 with the draft amended appendix B.2 of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). At the request of WP.15, the complete and/or the completed vehicle provisions are proposed to be introduced. However, it is the opinion of the WP.29 secretariat that in such case further modifications will be necessary, in particular to distinguish between approvals of base vehicles and/or those of complete or completed vehicles. Also provisions concerning braking may need to be introduced into annex 5 of Regulation No. 13 instead of into this Regulation.

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Note: This document is distributed to the Experts on General Safety Provisions only.

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Paragraph 1., amend to read (including a new footnote 1/):

" .....apply to vehicles of category N and O 1/ intended for the carriage of dangerous goods with regard to the European Agreement concerning the International Carriage of Dangerous Goods (ADR)."

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1/ As defined in the Consolidated Resolution of the Construction of Vehicles (R.E.3), annex 7 (document TRANS/WP.29/78/Rev. 1 as amended)."

Insert a new paragraph 2.1., to read:

"2.1.            "Vehicle", means any vehicle, whether complete (e.g. one stage built vans, lorries, tractors, trailers), incomplete (e.g. chassis, chassis-cab, trailer chassis) or, completed (e.g. Chassis-cab fitted with a bodywork), intended for the carriage of dangerous goods."

Paragraph 2.1.(former), renumber as paragraph 2.2. and amend to read:

"2.2.            "Base vehicle", means a chassis-cab ..... "

Paragraph 2.2.(former), renumber as paragraph 2.3.

Paragraph 4.4.1. the footnote 1/ (former), renumber as footnote 2/ and amend to read:

"2/ 1 for .... 33 vacant, 34 for Bulgaria, 35-36 vacant, ... , 44 (vacant), and for Australia. Subsequent numbers ...."

Paragraph 5.1., amend to read (footnote 2/ (former) renumbered as footnote 3/ not amended):

"5.1.            PROVISIONS FOR BASE VEHICLES  
  
                  Vehicles shall, depending ..... "

Paragraph 5.1., the table, amend to read:

TECHNICAL SPECIFICATIONS		VEHICLE DESIGNATION ([MARGINAL 220 301 (2)] OF THE ADR)				
		EX/II	EX/III	AT	FL	OX
	<b>Electrical equipment</b>					
5.1.1.2.	Wiring		X	X <u>a</u> /	X	X
5.1.1.3.	Battery master switch					
5.1.1.3.1.			X		X	
5.1.1.3.2.			X		X	
5.1.1.3.3.				X		
5.1.1.3.4.			X		X	
5.1.1.4.	Batteries	X	X		X	
5.1.1.5.	Permanently energized circuits					
5.1.1.5.1.					X	
5.1.1.5.2.			X			
5.1.1.6.	Electrical installation at the rear of the cab		X		X	
	<b>Fire risks</b>					
5.1.2.2.1.	Cab : materials	X	X			
5.1.2.2.2	Cab : thermal shield					X
5.1.2.3.	Fuel tanks	X	X		X	X
5.1.2.4.	Engine	X	X		X	X
5.1.2.5	Exhaust system	X	X		X	
5.1.2.6	Endurance braking system		X	X	X	X
5.1.2.7.1.	Combustion heaters	X <u>e</u> /	X <u>e</u> /	X <u>e</u> /	X <u>e</u> /	X <u>e</u> /
5.1.2.7.2.	Combustion heaters	X <u>e</u> /	X <u>e</u> /	X <u>e</u> /	X <u>e</u> /	X <u>e</u> /

5.1.2.7.3.	Combustion heaters	X	X			
5.1.2.7.4.	Combustion heaters	X	X			
5.1.2.7.5.	Combustion heaters	X <u>e/</u>	X <u>e/</u>	X <u>e/</u>	X <u>e/</u>	X <u>e/</u>
5.1.2.7.6.	Combustion heaters	X	X			
	<b>Braking</b>					
5.1.3.1.	Special provisions	X	X	X	X	X
5.1.3.2.	Anti-lock		X <u>b/</u> , <u>d/</u>	X <u>b/</u> , <u>d/</u>	X <u>b/</u> , <u>d/</u>	X <u>b/</u> , <u>d/</u>
5.1.3.3.	Endurance		X <u>c/</u> , <u>d/</u>	X <u>c/</u> , <u>d/</u>	X <u>c/</u> , <u>d/</u>	X <u>c/</u> , <u>d/</u>
5.1.3.4.1.	Safety braking system	X				
5.1.3.4.2.	Safety braking system		X			
5.1.4.	<b>Speed limitation</b>	X <u>f/</u>	X <u>f/</u>	X <u>f/</u>	X <u>f/</u>	X <u>f/</u>
5.1.5.	<b>Coupling device</b>	X	X			

a/ Applicable to all AT vehicles carrying tank-containers as from 1 January 2005

b/ Applicable to all vehicles as from 30 June 2001

c/ Reserved

d/ Applicable to all vehicles as from 30 June 2010

e/ Applicable to all vehicles as from 30 June 2001

f/ Applicable to motor vehicles with a maximum mass of 12 tonnes "

Paragraph 5.1.1.2.1., amend to read:

" ..... except for the following:

- from the battery to the cold start and .... "

Paragraph 5.1.1.3.1., amend to read:

"5.1.1.3.1. A practicable switch for breaking ..... "

Paragraph 5.1.1.3.2., amend to read:

"5.1.1.3.2. 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."

Paragraph 5.1.1.3.3., amend to read:

"5.1.1.3.3. The switch shall have a casing with protection degree IP65 in accordance with IEC Standard 529."

Paragraph 5.1.1.3.4., amend to read:

"5.1.1.3.4. The cable connections on the switch shall have protection degree IP54. However, this ..... "

Paragraph 5.1.1.5., shall be deleted

Paragraph 5.1.1.6. (former), renumber as paragraph 5.1.1.5. and amend to read:

"5.1.1.5. Permanently energized circuits

5.1.1.5.1. Those parts of the electrical installation, including the leads which remain energized when the battery master-switch is open, shall be suitable for use in hazardous areas. Such equipment shall meet the appropriate requirements of IEC 60079 4/, parts 0 and 14 and the additional requirements applicable of IEC parts 1, 2, 5, 6, 7, 11, 15 or 18 5/

For the application of IEC 60079 part 14 5/, the following classification shall be used

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4/ The requirements of IEC 60079, part 14 do not take precedence over the requirements of this part.

5/ As an alternative, the general requirements of EN 50014 and the

additional requirements of EN 50015, 50016, 50017, 50018, 50019, 50020, or 50028 may be used."

Permanently energized electrical equipment including the leads which is not subject to paragraphs 5.1.1.3. and 5.1.1.4. shall meet the requirements for zone 1 for electrical equipment situated in the driver's cab. The requirements for explosion group IIC, temperature class T6, shall be met.

5.1.1.5.2. 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)

Paragraph 5.1.1.7. (former), renumber as paragraph 5.1.1.6. and amend to read:

" .... under normal conditions of use of vehicles and that these risks .... "

Paragraph 5.1.1.7.1. (former), renumber as paragraph 5.1.1.6.1. and amend to read:

" The wiring located to the rear of the driver's cab .... figures 1, 2, 3, and 4 below. However, the sensor ..."

Paragraphs 5.1.1.7.2. and 5.1.1.7.3.(former), renumber as paragraphs 5.1.1.6.2. and 5.1.6.3.

Paragraph 5.1.1.7.4. (former), should be deleted

Paragraph 5.1.2.1., amend to read:

"5.1.2.1. General provisions

The following technical ... "

Paragraph 5.1.2.2.2., amend to read:

" ..... cab is made of materials which are not readily flammable, a shield made of ..... fitted at the rear of the cab. Any window in the rear of the cab ... "

Paragraph 5.1.2.3.2., amend to read:

" .... with a closure enabling the opening to be kept ..."

Paragraph 5.1.2.4., amend to read:

" .... In the case of EX/II and EX/III vehicles, the engine shall be of compression ignition construction."

Paragraph 5.1.2.5., amend to read:

" .... or be protected by a thermal shield."

Paragraph 5.1.2.7.2., amend to read:

" ..... any risk of unacceptable risk of heating or ...."

Paragraph 5.1.2.7.3., amend to read:

" .....

(b) Stopping of the vehicle engine; in this ... "

Insert new paragraphs 5.1.2.7.6. and 5.1.2.7.7., to read:

"5.1.2.7.6. Combustion heaters with gaseous fuels are not permitted .

5.1.2.7.7. For combustion heaters designed to heat tanks or load compartment:

- (a) the switch may be installed outside the driver's cabin;
- (b) the device may be switched off from outside the load compartment; and
- (c) it is not necessary to prove that the heat exchanger is resistant to the reduced after running cycle."

Paragraph 5.1.3., amend to read:

"5.1.3. Braking equipment

5.1.3.1. General provisions

In addition to the following technical provisions, to be applied in accordance with the table of section 5.1.1, motor vehicles and trailers intended for use as transport units for dangerous goods shall fulfil all relevant technical requirements of Regulation No.13 6/, in accordance with the dates of application specified therein.

5.1.3.2. Anti-lock braking system

5.1.3.2.1. Motor vehicles having a maximum mass exceeding 16 tonnes, or authorized to tow a trailer with a maximum mass exceeding 10 tonnes, shall be equipped with an anti-lock braking system of category 1 according to Regulation No. 13.

5.1.3.2.2. Trailers having a maximum mass exceeding 10 tonnes shall be equipped with an anti-lock braking system of category A according to Regulation No. 13,

5.1.3.3. Endurance braking system

5.1.3.3.1. Endurance braking system means a system intended to stabilize



vehicle speed on a long descent, without the use of the service, secondary or parking braking systems.

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6/ As an alternative, the corresponding provisions of European Community Directive 71/320/EEC, as amended, may apply provided that they have been amended in accordance with the latest amended form of ECE Regulation No. 55 applicable at the time of the vehicle approval.

5.1.3.3.2 Motor vehicles having a maximum mass exceeding 16 tonnes or authorized to tow a trailer with a maximum mass exceeding 10 tonnes shall be fitted with an endurance braking system which complies with the following requirements:

- (a) The endurance braking system may be a single device or a combination of several devices. Each device may have its own control;
- (b) All three endurance braking control options provided for in Regulation No. 13, shall be permitted, but, in the case of a failure of the anti-lock system, integrated or combined retarders shall be switched off automatically;
- (c) The effectiveness of the endurance braking system shall be controlled by the anti-lock braking system such that the axle(s) braked by the endurance braking system cannot be locked by the endurance braking system at speeds above 15 km/h. However, this provision shall not apply to that part of the braking system constituted by natural engine braking;
- (d) The endurance braking system shall comprise several stages of effectiveness, including a low stage appropriate for the unladen condition. Where the endurance braking system of a motor vehicle is constituted by its engine, the different gear ratios shall be considered to provide the different stages of effectiveness;
- (e) The performance of the endurance braking system must be such that it fulfils the requirements of Regulation No. 13, annex 5 (Type II A test), with a laden vehicle mass comprising the laden mass of the motor vehicle and its authorized maximum towed mass but not exceeding a total of 44 tonnes;
- (f) If the motor vehicle does not fulfil the performance requirements for the endurance braking system as defined in paragraph (e) above, it shall at least fulfil the requirements of Regulation No. 13, annex 5, and shall be restricted to being coupled only to a trailer fitted with an endurance braking system. Such a motor vehicle must be fitted with a control device for the endurance braking system on the trailer.

5.1.3.3.3. If a trailer is equipped with an endurance braking system it shall fulfil the requirements of Regulation No. 13, annex 5, and the provisions of paragraphs 5.1.3.3.2 (a) to (d) above.

5.1.3.4. Emergency braking devices for trailers

5.1.3.4.1. Trailers shall be equipped with an effective system for braking or restraining them if they become detached from the motor vehicle towing them (EX/II, 11 204 (1) (c)).

- 5.1.3.4.2 Trailers shall be fitted with an effective braking device which acts on all the wheels, is actuated by the drawing vehicle's service-brake control and automatically stops the trailer in the event of breakage of the coupling.

Note: The use of trailers equipped only with an inertia braking system shall be limited to a maximum load of 50 kg net explosive mass [11 204 (2) (c); EX/III]."

Paragraph 5.1.4., amend (including a new footnote 7/) to read:

"5.1.4. Speed limitation device

Motor vehicles ..... of ECE Regulation No. 89 7/. The limitation speed v as defined in para. 2.1.2. of ....

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7/ As an alternative, the corresponding provisions of European Community Directives 92/6/EEC and 92/24/EEC, as amended, may apply provided that they have been amended in accordance with the latest amended form of ECE Regulation No. 89 applicable at the time of the vehicle approval."

Insert a new paragraph 5.1.5. and its corresponding footnote 8/, to read:

"5.1.5. Coupling devices of trailers

Coupling devices of trailers shall comply with ECE Regulation No. 55 8/.

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8/ As an alternative, the corresponding provisions of European Community Directive 94/20/EC, as amended, may apply provided that they have been amended in accordance with the latest amended form of ECE Regulation No. 55 applicable at the time of the vehicle approval."

Insert new paragraphs 5.2. to 5.6.8.2., to read:

"5.2. ADDITIONAL REQUIREMENTS CONCERNING COMPLETE OR COMPLETED EX/II OR EX/III VEHICLES

5.2.1 Materials to be used in the construction of vehicle bodies

No materials likely to form dangerous compounds with the explosive substances and articles carried shall be used in the construction of the body.

5.2.2. Combustion heaters

Combustion heaters shall not be installed in load compartments of EX/II and EX/III vehicles.

Combustion heaters shall meet the relevant requirements of paragraph 5.1.2.7. No fuel tanks, power sources, combustion air or heating air intakes as well as exhaust tube outlets required for the operation of the combustion heater shall be

installed in the load compartment. It shall be ensured that the heating air outlet cannot be blocked by cargo. The temperature to which packages are heated must not exceed 50E C. Heating devices installed inside the load compartments shall be designed so as to prevent the ignition of an explosive atmosphere under operating conditions.

5.2.3. EX/II vehicles

The vehicles shall be designed, constructed and equipped so that the explosives are protected from external hazards and the weather. They shall be either closed or sheeted. Sheeting shall be resistant to tearing and be of impermeable material, not readily flammable. It shall be tautened so as to cover the vehicle on all sides, with an overlap of not less than 20 cm down the sides of the vehicle, and be kept in position by a lockable device.

The load carrying compartment of closed vehicles shall not have windows and all openings shall have lockable, close-fitting doors or covers.

5.2.4. EX/III vehicles

These vehicles shall be closed. The loading surface, including the front wall, shall be continuous. The insulating and heat resisting properties of the body shall be at least equivalent to those of a partition consisting of a metal outer wall lined with a layer of fire-proofed wood of 10 mm thickness; or the body shall be of a construction which shall ensure that no flame penetration of the wall or hot spots of more than 120E C on the inner wall surface will occur within 15 minutes from the start of a fire resulting from the operation of the vehicle, such as a tyre fire. All the doors shall be capable of being locked. They shall be so placed and constructed as to overlap the joints.

5.2.5. Load compartment and engine

The engine shall be placed forward of the front wall of the load compartment; it may nevertheless be placed under the load compartment, provided this is done in such a way that any excess heat does not constitute a hazard to the load by raising the temperature on the inner surface of the load compartment above 80E C.

5.2.6. Load compartment and exhaust system

The exhaust system of EX/II and EX/III vehicles or other parts of these complete or completed vehicles shall be so constructed and situated that any excess heat shall not constitute a hazard to the load by raising the temperature on the inner surface of the load compartment above 80E C.

5.2.7. Electrical equipment

- 5.2.7.1. The electrical installation on EX/III vehicles shall meet the requirements of paragraphs 5.1.1.2., 5.1.1.3., 5.1.1.4., 5.1.1.5.2. and 5.1.1.6.

- 5.2.7.2 The rated voltage of the electrical system shall not exceed 24 V.
- 5.2.7.3 The electrical installation in the load compartment shall be dust-protected (at least IP54 or equivalent) or, in the case of Compatibility Group J, at least IP65 (e.g. flame-proof Ex.d).
- 5.3. ADDITIONAL REQUIREMENTS CONCERNING THE CONSTRUCTION OF THE BODIES OF VEHICLES, OTHER THAN EX/II AND EX/III, INTENDED FOR THE TRANSPORT OF DANGEROUS GOODS IN PACKAGES
- 5.3.1 Combustion heaters shall meet the relevant requirements of paragraph 5.1.2.7.
- 5.3.2 In the case of a vehicle intended for the carriage of dangerous goods for which a label of models Nos. 1, 3, 4.1, 5.1 or 5.2 of ADR is prescribed, no fuel tanks, power sources, combustion air or heating air intakes as well as exhaust tube outlets required for the operation of the combustion heater shall be installed in the load compartment. It shall be ensured that the heating air outlet cannot be blocked by cargo. The temperature to which packages are heated must not exceed 50E C. Heating devices installed inside the load compartments shall be designed so as to prevent the ignition of an explosive atmosphere under operating conditions.
- 5.3.3 Additional requirements concerning the construction of the bodies of vehicles intended for the transport of given dangerous goods or specific packaging may be included in Part [7], Chapter [7.2] of ADR in accordance with the indications in column [...] of table A, contained in Chapter 3.2 of ADR, for a given substance.
- 5.4. ADDITIONAL REQUIREMENTS CONCERNING THE CONSTRUCTION OF THE BODIES OF COMPLETE OR COMPLETED VEHICLES INTENDED FOR THE TRANSPORT OF DANGEROUS SOLIDS IN BULK
- Additional requirements concerning the construction of the bodies of vehicles intended for the transport of dangerous solids in bulk may appear in Part [7], Chapter [7.3] of ADR, in accordance with the indications in column [...] of table A, contained in Chapter 3.2 of the ADR, for a given substance.
- Combustion heaters shall meet the relevant requirements of paragraph 5.1.2.7.
- 5.5. ADDITIONAL REQUIREMENTS CONCERNING THE CONSTRUCTION OF THE BODIES OF COMPLETE OR COMPLETED VEHICLES INTENDED FOR THE TRANSPORT OF TEMPERATURE CONTROLLED SELF-REACTIVE SUBSTANCES OF CLASS 4.1 AND ORGANIC PEROXIDES OF CLASS 5.2 OF THE ADR
- 5.5.1. Insulated, refrigerated and mechanically-refrigerated

vehicles intended for the carriage of temperature controlled self-reactive substances of Class 4.1 and organic peroxides of Class 5.2 of the ADR shall conform to the following conditions:

- (a) the vehicle shall be such and so equipped as regards its insulation and means of refrigeration, that the control temperature prescribed in the ADR, paragraphs 2.2.41.1 (19) and 2.2.52.1 (16) and in sections 2.2.41.4 and 2.2.52.4 for the substance to be carried is not exceeded. The overall heat transfer coefficient shall be not more than  $0.4 \text{ W/m}^2\text{K}$ ;
- (b) the vehicle shall be so equipped that vapours from the substances or the coolant carried cannot penetrate into the driver's cab;
- (c) a suitable device shall be provided enabling the temperature prevailing in the loading space to be determined at any time from the cab;
- (d) the loading space shall be provided with vents or ventilating valves if there is any risk of a dangerous excess pressure arising therein. Care shall be taken where necessary to ensure that refrigeration is not impaired by the vents or ventilating valves;
- (e) the refrigerant shall not be flammable; and
- (f) the refrigerating appliance of a mechanically refrigerated vehicle shall be capable of operating independently of the engine used to propel the vehicle.

5.5.2. Suitable methods to prevent the control temperature from being exceeded are listed in Chapter 7.2 of the ADR. Depending on the method used, additional requirements concerning the construction of vehicle bodies may be included in Chapter 7.2 of the ADR.

5.6. ADDITIONAL REQUIREMENTS CONCERNING TANK VEHICLES (FIXED TANKS), BATTERY VEHICLES AND COMPLETE OR COMPLETED VEHICLES INTENDED FOR THE TRANSPORT OF DANGEROUS GOODS IN DEMOUNTABLE TANKS WITH A CAPACITY GREATER THAN 1,000 LITRES OR IN TANK-CONTAINERS OF A CAPACITY GREATER THAN 3,000 LITRES (FL, OX, AND AT VEHICLES)

5.6.1. General provisions

5.6.1.1. In addition to the vehicle proper, or the units of running gear used in its stead, a tank-vehicle comprises one or more shells, their items of equipment and the fittings for attaching them to the vehicle or to the running-gear units.

- 5.6.1.2. Once the demountable tank has been attached to the carrier vehicle, the entire unit shall meet the requirements prescribed for tank-vehicles.



5.6.2. Requirements concerning tanks

5.6.2.1. Fixed tanks or demountable tanks made of metal shall meet the relevant requirements of Chapter 6.8. of the ADR.

5.6.2.2. Elements of battery-vehicles and of MEGCs shall meet the relevant requirements of Chapter 6.2 of the ADR in the case of cylinders, tubes, pressure drums and bundles of cylinders and the requirements of Chapter 6.8 of the ADR in the case of tanks.

[5.6.2.3. Tank-containers made of metal shall meet the requirements of Chapter 6.7 of the ADR in the case of United Nations multimodal portable tanks, those of Chapter 6.8 of the ADR in the case of "RID/ADR" tank-containers and the relevant requirements of the IMDG Code for "IMO" tanks.]

5.6.2.4. Tanks made of fibre-reinforced plastics material shall meet the requirements of Chapter 6.9 of the ADR.

5.6.2.5. Vacuum-operated waste tank-vehicles shall meet the requirements of Chapter 6.10 of the ADR.

5.6.3. Fastenings

5.6.3.1. Fastenings shall be designed to withstand static and dynamic stresses in conditions of carriage, and minimum stresses as defined in paragraph [6.8 ...] of the ADR in the case of tank-vehicles and battery-vehicles, and [6.8 ...] of the ADR in the case of vehicles carrying tank-containers portable tanks or MEGCs.

5.6.4. Earthing of FL vehicles

Tanks made of metal or of fibre-reinforced plastics material of FL tank-vehicles and battery elements of FL battery-vehicles shall be linked to the chassis by means of at least one good electrical connection. Any metal contact capable of causing electrochemical corrosion shall be avoided.

Note: see also 6.9.1.2. and 6.9.2.14.3. of the ADR.

5.6.5. Stability of tank/vehicles

5.6.5.1. Tank vehicles shall comply with Regulation No. 111

5.6.5.2. In addition, tank-vehicles with fixed tanks with a capacity of more than 3,000 litres intended for the carriage of dangerous goods in the liquid or molten state, and tanks tested with a pressure of less than 4 bar, shall comply with Regulation No. 111. The requirements are applicable to tank-vehicles which are first put into service as from 1 January 2002.

5.6.6. Rear protection of vehicles

A bumper sufficiently resistant to rear impact shall be fitted over the full width of the tank at the rear of the vehicle. There shall be a clearance of at least 100 mm between the rear wall of the tank and the rear of the bumper (this clearance being measured from the rearmost point of the tank wall or from projecting fittings or accessories in contact with the substance being carried). Vehicles with a tilting shell for the carriage of powdery or granular substances and a vacuum-operated waste tank with a tilting shell with rear discharge do not require a bumper if the rear fittings of the shell are provided with a means of protection which protects the shell in the same way as a bumper.

Note 1: This provision does not apply to vehicles used for the carriage of dangerous goods in tank-containers.

Note 2: For the protection of tanks against damage by lateral impact or overturning, see [marginal 211 127 (4) and (5) and marginal 212 127 (4) and (5)].

5.6.7. Combustion heaters

Combustion heaters shall meet the relevant requirements of paragraph 5.2.1.7

5.6.8. Electrical equipment

5.6.8.1. Electrical equipment on FL vehicles, situated in areas where an explosive atmosphere is, or may be expected to be, present in such quantities as to require special precautions, shall be suitable for use in a hazardous area. Such equipment shall meet the general requirements of IEC 60079 parts 0 and 14 and the additional requirements applicable from IEC 60079 parts 1, 2, 5, 6, 7, 11 or 18 5/. The requirements for the relevant gas group according to the substances to be carried shall be met.

For the application of IEC 60079 part 14 5/, the following classification shall be used:

ZONE 0

Inside tank compartments, fittings for filling and discharge and vapour recovery lines.

ZONE 1

Inside cabinets for equipment used for loading and unloading and within 0.5 m of venting devices and pressure relief safety valves.

5.6.8.2. Permanent energized electrical equipment, including the leads, which is situated outside Zones 0 and 1 shall meet the

requirements for Zone 1 for electrical equipment situated in the driver's cab. The requirements for relevant gas group according to the substances to be carried shall be met".

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