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#### World Forum for Harmonization of Vehicle Regulations

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Item 4.13.1 of the provisional agenda

##### **1958 Agreement – Consideration of draft amendments to existing Regulations submitted by GRPE**

### **Proposal for a new Regulation on recyclability of motor vehicles**

#### **Submitted by the Working Party on Pollution and Energy (GRPE)\***

The text reproduced below was adopted by the Working Party on Pollution and Energy (GRPE) at its sixty-fifth session (ECE/TRANS/WP.29/GRPE/65, para. 71). It is based on ECE/TRANS/WP.29/2012/116, as amended by para. 71 of the GRPE report. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee AC.1 for consideration.

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\* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, 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.

## Uniform provisions concerning the approval of motor vehicles with regard to their reusability, recyclability and recoverability

### 1. Scope

- 1.1. This Regulation applies to motor vehicles of categories M<sub>1</sub> and N<sub>1</sub><sup>1</sup> and to new parts in these vehicles.
- 1.2. This Regulation shall not apply to:
  - (a) Special purpose vehicles;
  - (b) Multi-stage built vehicles belonging to category N<sub>1</sub>, provided that the base vehicle complies with this Regulation;
  - (c) Vehicles produced in small series with less than 1,000 units per year sold in the country of a Contracting Party to the 1958 Agreement.

### 2. Definitions

For the purposes of this Regulation, the following definitions shall apply:

- 2.1. "*Vehicle*" means a motor vehicle<sup>2</sup>;
- 2.2. "*Component part*" means any part or any assembly of parts which is included in a vehicle at the time of its production.
- 2.3. "*Vehicle type*" means vehicles of a particular category which do not differ in at least the following essential respects:
  - (a) The manufacturer;
  - (b) The manufacturer's type designation;
  - (c) Essential aspects of construction and design;
  - (d) Chassis/floor pan (obvious and fundamental differences).
- 2.4. "*End-of life vehicle*" means a vehicle which the holder discards or intends or is required to discard;
- 2.5. "*Reference vehicle*" means the version within a type of vehicle, which is identified by the Type Approval Authority, in consultation with the manufacturer and in accordance with the criteria laid down in Annex 1, para. 4. to this Regulation, as being the most problematic in terms of reusability, recyclability and recoverability;

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<sup>1</sup> As defined in the Consolidated Resolution on the Construction of vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.2, para. 2. - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

<sup>2</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 1. - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

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- 2.6. "*Multi-stage built vehicle*" means a vehicle resulting from a multi-stage construction process;
- 2.7. "*Reuse*" means any operation by which components of end-of life vehicles are used for the same purpose for which they were conceived;
- 2.8. "*Recycling*" means the reprocessing in a production process of the waste materials for the original purpose or for other purposes but excluding energy recovery;
- 2.9. "*Energy recovery*" means the use of combustible waste as a means to generate energy through direct incineration with or without other waste but with recovery of the heat;
- 2.10. "*Recovery*" means reprocessing in a production process of the waste materials for the original purpose or for other purposes, together with processing as a means of generating energy;
- 2.11. "*Reusability*" means the potential for reuse of component parts diverted from an end-of-life vehicle;
- 2.12. "*Recyclability*" means the potential for recycling of component parts or materials diverted from an end-of life vehicle;
- 2.13. "*Recoverability*" means the potential for recovery of component parts or materials diverted from an end-of life vehicle;
- 2.14. "*Recyclability rate of a vehicle (Rcyc)*" means the percentage by mass of a new vehicle, potentially able to be reused and recycled;
- 2.15. "*Recoverability rate of a vehicle (Rcov)*" means the percentage by mass of a new vehicle, potentially able to be reused and recovered;
- 2.16. "*Strategy*" means a large-scale plan consisting of coordinated actions and technical measures to be taken as regards dismantling, shredding or similar processes, recycling and recovery of materials to ensure that the targeted recyclability and recoverability rates are attainable at the time a vehicle is in its development phase;
- 2.17. "*Mass of a vehicle in running order*" means the mass of an unladen vehicle with bodywork, and with coupling device in the case of a towing vehicle, or the mass of the chassis with cab if the manufacturer does not fit the bodywork and/or coupling device, including coolant, oils, 90 per cent of fuel, 100 per cent of other liquids except used waters, tools, spare wheel, excluding the driver (75 kg);
- 2.18. "*Competent Authority*" means an entity, e.g. a Technical Service or another existing body, notified by a Contracting Party to carry out preliminary assessment of the manufacturer and to issue a certificate of compliance, in accordance with the prescriptions of this Regulation. The Type Approval Authority may be the Competent Authority provided its competence in this field is properly documented (see in particular paragraph 2. of Annex 5 to this Regulation).

### **3. Application for approval regarding reusability, recyclability and recoverability**

- 3.1. The application for approval of a vehicle type with regard to reusability, recyclability and recoverability shall be submitted by vehicle manufacturer or by his duly accredited representative.
- 3.2. It shall be accompanied by the technical information necessary for the purposes of the calculations and checks referred to in Annex 1 to this Regulation, relating to the nature of the materials used in the construction of the vehicle and its component parts.
- 3.3. In cases where such information is shown to be covered by intellectual property rights or to constitute specific know-how of the manufacturer or of his suppliers, the manufacturer or his suppliers shall supply sufficient information to enable those calculations to be made properly.
- 3.4. With regard to reusability, recyclability and recoverability, the Contracting Party shall ensure that the manufacturer uses the model of the information document set out in Annex 2 to this Regulation, when submitting an application for vehicle type approval.

### **4. Approval regarding reusability, recyclability and recoverability**

- 4.1. Contracting Parties shall grant, as appropriate, type approval with regard to reusability, recyclability and recoverability, only to such vehicle types that satisfy the requirements of this Regulation.
- 4.2. When granting a type-approval, the Type Approval Authority shall use the model of the type-approval certificate set out in Annex 3 to this Regulation.

### **5. Marking**

- 5.1. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a vehicle type approved under this Regulation an international approval mark consisting of:
  - 5.1.1. A circle surrounding the Letter 'E' followed by the distinguishing number of the country which has granted approval<sup>3</sup>.
  - 5.1.2. The number of this Regulation, followed by the Letter 'R', a dash and the approval number to the right of the circle described in paragraph 5.1.1.
- 5.2. If the vehicle conforms to a vehicle type approved under one or more other Regulations annexed to the Agreement in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 5.1.1. need not be repeated; in this case the Regulation and approval numbers and

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<sup>3</sup> The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.2/Amend.3 - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

the additional symbols of all the Regulations under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 5.1.1.

- 5.3. The approval mark shall be clearly legible and shall be indelible.
- 5.4. The approval mark shall be placed on or close to the vehicle data plate affixed by the Manufacturer.
- 5.5. Annex 4 to this Regulation gives examples of the arrangements of the approval mark.

## **6. Preliminary assessment of the manufacturer regarding reusability, recyclability and recoverability**

- 6.1. Contracting Parties shall not grant any type approval without first ensuring that the manufacturer has put in place satisfactory arrangements and procedures, in accordance with paragraphs 3.1. of Annex 5 to this Regulation, to manage properly the reusability, recyclability and recoverability aspects covered by this regulation.
- 6.2. Contracting Parties shall not grant any type approval without first ensuring that the manufacturer has put in place satisfactory arrangements and procedures, in accordance with paragraphs 3.5 and 3.6. of Annex 5 to this Regulation, to manage material and substance restrictions.
- 6.3. When this preliminary assessment has been carried out, a certificate named Certificate of Compliance with Annex 5 to this Regulation (hereinafter the Certificate of Compliance) shall be granted to the manufacturer.
- 6.4. In the context of the preliminary assessment of the manufacturer, Contracting Parties shall ensure, that the manufacturer has installed the necessary processes to comply with all legal requirements from this which are relevant for vehicle design or production.
- 6.5. For the purpose of paragraph 1., the manufacturer shall recommend a strategy to ensure dismantling, reuse of component parts, recycling and recovery of materials. The strategy shall take into account the proven technologies available or in development at the time of the application for a vehicle type-approval.
- 6.6. Contracting Parties shall appoint a competent authority, in accordance with paragraph 2. of Annex 5 to this Regulation, to carry out the preliminary assessment of the manufacturer and to issue the certificate of compliance.
- 6.7. The certificate of compliance shall include the appropriate documentation and describe the strategy recommended by the manufacturer. The Type Approval Authority or Technical Service shall use the model set out in the Appendix to Annex 5 to this Regulation.
- 6.8. The certificate of compliance shall remain valid for no less than two years from the date of deliverance of the certificate before new checks shall be conducted.

- 6.9. The manufacturer shall inform the Type Approval Authority of any significant change that could affect the relevance of the certificate of compliance. After consultation with the manufacturer, the Type Approval Authority or Technical Service shall decide whether new checks are necessary.
- 6.10. At the end of the period of validity of the certificate of compliance, the Type Approval Authority shall, as appropriate, issue a new certificate of compliance or extends its validity for a further period of two years. The competent authority shall issue a new certificate in cases where significant changes have been brought to the attention of the Type Approval Authority or Technical Service.

## **7. Reuse of component parts**

- 7.1. The component parts listed in Annex 6 to this Regulation shall:
- (a) Be deemed to be non-reusable for the purposes of calculating the recyclability and recoverability rates;
  - (b) Not be reused in the construction of vehicles covered by this Regulation.

## Annex 1

### Requirements

1. Vehicles belonging to category M<sub>1</sub> and those belonging to category N<sub>1</sub> shall be so constructed as to be:
  - (a) Reusable and/or recyclable to a minimum of 85 per cent by mass, and
  - (b) Reusable and/or recoverable to a minimum of 95 per cent by mass, as determined by the procedures laid down in this Annex.
2. For the purposes of type-approval, the manufacturer shall submit a data presentation form duly completed, established in accordance with Annex A to ISO standard 22628: 2002. It shall include the materials breakdown.
  - 2.1. It shall be accompanied by a listing of the dismantled component parts, declared by the manufacturer with respect to the dismantling stage, and the process he recommends for their treatment.
  - 2.2. The process shall be based on a technology which has been successfully tested, at least on a laboratory scale (proven technology).
3. For the application of paragraphs 1. and 2., the manufacturer shall demonstrate to the satisfaction of the Type Approval Authority that the reference vehicles meet the requirements. The calculation method prescribed in Annex B to ISO standard 22628: 2002 shall apply.
  - 3.1. However, the manufacturer shall be in a position to demonstrate that any version within the vehicle type complies with the requirements of this Regulation.
4. For the purposes of the selection of the reference vehicles, a vehicle shall be selected with the following criteria:
  - (a) Lightest engine;
  - (b) Lightest manual gearbox;
  - (c) Smallest tires, no spare wheel;
  - (d) No trailer coupling;
  - (e) No all-wheel drive;
  - (f) Bodywork saloon or station wagon;
  - (g) (Leather trim).
5. The manufacturer and the Type Approval Authority jointly identify the reference vehicle in accordance with the criteria listed under paragraph 4.
6. For the purposes of calculations, tyres shall be considered as recyclable.
7. Masses shall be expressed in kg with one decimal place. The rates shall be calculated in per cent with one decimal place, then rounded as follows:
  - (a) If the figure following the decimal point is between 0 and 4, the total is rounded down;

- (b) If the figure following the decimal point is between 5 and 9, the total is rounded up.
- 8. For the purposes of checking the calculations referred to in this Annex, the Type Approval Authority shall ensure that the data presentation form referred to in paragraph 2. is coherent with the recommended strategy annexed to the certificate of compliance referred to in paragraph 6.3. of this Regulation.
- 9. For the purposes of checks of the materials and masses of component parts, the manufacturer shall make available vehicles and component parts as deemed necessary by the Type Approval Authority.



## Annex 2

### Information document

The following information, if applicable, must be supplied in triplicate and include a list of contents. Any drawings must be supplied in appropriate scale and in sufficient detail on size A4 or on a folder of A4 format. Photographs, if any, must show sufficient detail.

0. General
  - 0.1. Make (trade name of manufacturer): .....
  - 0.2. Type: .....
  - 0.2.0.1. Chassis: .....
  - 0.2.1. Commercial name(s) (if available): .....
  - 0.3. Means of identification of type, if marked on the vehicle (b): .....
  - 0.3.1. Location of that marking: .....
  - 0.4. Category of vehicle (c): .....
  - 0.5. Name and address of manufacturer: .....
  - 0.8. Address(es) of assembly plant(s): .....
1. General construction characteristics of the vehicle
  - 1.1. Photographs and/or drawings of a representative vehicle: .....
  - 1.2. Dimensional drawing of the whole vehicle: .....
  - 1.3. Number of axles and wheels: .....
  - 1.3.1. Number and position of axles with double wheels: .....
  - 1.3.2. Powered axles (number, position, interconnection): .....
  - 1.4. Driving cab (forward control or bonneted)(z): .....
2. Power plant (q) (In the case of a vehicle that can run either on petrol, diesel, etc., or also in combination with another fuel, items shall be repeated (+))
  - 2.1. Manufacturer: .....
  - 2.2. Internal combustion engine .....
  - 2.2.1. Specific engine information .....
  - 2.2.1.1. Working principle: positive ignition/compression ignition, four-stroke/two stroke
  - 2.2.1.2. Number and arrangement of cylinders: .....
  - 2.2.1.3. Engine capacity (s): cm<sup>3</sup> .....
  - 2.2.2. Fuel: diesel oil/petrol/LPG/NG/ethanol<sup>1</sup>: .....

<sup>1</sup> Strike out which does not apply.

- 3. Transmission (v)
  - 3.1. Type (mechanical, hydraulic, electric, etc.): .....
  - 3.2. Gearbox
    - 3.2.1. Type (manual/automatic/CVT (continuously variable transmission))<sup>1</sup>
  - 3.3. Differential lock: yes/no/optional<sup>1</sup>
- 4. Bodywork
  - 4.1. Type of bodywork: .....
  - 4.1.1. Door configuration and number of doors: .....
  - 4.2. Seats
    - 4.2.1. Number: .....
- 5. Reusability, recyclability and recoverability
  - 5.1. Version to which the reference vehicle belongs: .....
  - 5.2. Mass of the reference vehicle with bodywork or mass of the chassis with cab, without bodywork and/or coupling device if the manufacturer does not fit the bodywork and/or coupling device (including liquids, tools, spare wheel, if fitted) without driver: .....
  - 5.3. Masses of materials of the reference vehicle
    - 5.3.1. Mass of material taken into account at the pre-treatment step: .....
    - 5.3.2. Mass of material taken into account at the dismantling step: .....
    - 5.3.3. Mass of material taken into account at the non-metallic residue treatment step, considered as recyclable: .....
    - 5.3.4. Mass of material taken into account at the non-metallic residue treatment step, considered as energy recoverable: .....
    - 5.3.5. Materials breakdown: .....
    - 5.3.6. Total mass of materials, which are reusable and/or recyclable: .....
    - 5.3.7. Total mass of materials, which are reusable and/or recoverable: .....
  - 5.4. Rates
    - 5.4.1. Recyclability rate R<sub>cy</sub> (%): .....
    - 5.4.2. Recoverability rate R<sub>co</sub> (%): .....

### Annex 3

## Communication

(maximum format: A4 (210 x 297 mm))



issued by: Name of administration:

.....  
 .....  
 .....

concerning<sup>2</sup>: Approval granted  
 Approval extended  
 Approval refused  
 Approval withdrawn  
 Production definitively discontinued

a type of vehicle with regard to .....

Approval No. .... Extension No. ....

### Section I

- 0.1. Make (trade name of manufacturer).....
- 0.2. Type: .....
- 0.2.1. Commercial name(s): .....
- 0.3. Means of identification of type, if marked on the vehicle: .....
- 0.3.1. Location of that marking: .....
- 0.4. Category of vehicle<sup>3</sup>: .....
- 0.5. Name and address of manufacturer: .....
- 0.6. Name(s) and address(es) of assembly plant(s):.....

<sup>1</sup> Distinguishing number of the country which has granted/refused/withdrawn approval (see approval provisions in the Regulation).

<sup>2</sup> Strike out which does not apply.

<sup>3</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 2. -

[www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

**Section II**

- 1. Additional information: .....  
Recyclability rate(s) of the reference vehicle(s): .....  
Recoverability rate(s) of the reference vehicle(s): .....
- 2. Technical Service responsible for carrying out the tests:.....
- 3. Date of test report: .....
- 4. Reference of test report:.....
- 5. Remarks (if any): .....
- 6. Attachments: the index and information package
- 7. The vehicle meets/does not meet<sup>2</sup> the technical requirements of this Regulation:.....

(Place)

(Signature)

(Date)

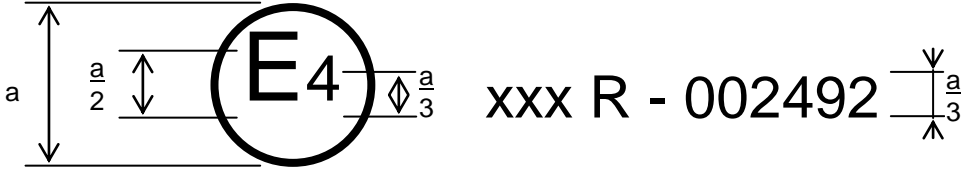
Attachments: Information package.

**Annex 4**

**Arrangements of approval marks**

**Model A**

(see paragraph 4.2 of this Regulation)



a = 8 mm min.

The above approval mark affixed to a vehicle shows that the road vehicle type concerned has been approved in the Netherlands (E4), pursuant to Regulation No. xxx, and under the approval number 002492. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. xxx.

## Annex 5

### **Preliminary assessment of the manufacturer regarding reusability, recyclability and recoverability**

1. Purpose of this annex
  - 1.1. This annex describes the preliminary assessment that must be carried out by the Competent Authority to ensure that the manufacturer has put in place the necessary arrangements and procedures.
2. Competent Authority
  - 2.1. The Competent Authority shall comply with standard ISO/IEC Guide 62: 1996 on the general criteria for certification bodies operating quality system certification as regards the management systems implemented by the manufacturer.
3. Checks to be performed by the Competent Authority
  - 3.1. The Competent Authority shall ensure that the manufacturer has taken the necessary measures to:
    - (a) Collect appropriate data through the full chain of supply, in particular the nature and the mass of all materials used in the construction of the vehicles, in order to perform the calculations required under this regulation;
    - (b) Keep at his disposal all the other appropriate vehicle data required by the calculation process such as the volume of the fluids, etc.;
    - (c) Check adequately the information received from suppliers;
    - (d) Manage the breakdown of the materials;
    - (e) Be able to perform the calculation of the recyclability and recoverability rates in accordance with ISO standard 22628: 2002;
    - (f) Verify that no component part listed in Annex 6 is reused in the construction of new vehicles;
    - (g) Mark the component parts made of polymers and elastomers in accordance with the requirements of paragraph 3.3. and 3.4. of this annex.
  - 3.2. The manufacturer shall provide the Competent Authority with all relevant information, in documentary form. In particular, recycling and recovery of materials shall be properly documented.
  - 3.3. For the labelling and identification of vehicle plastic components and materials having a weight of more than 100 grams, the following nomenclature applies:
    - (a) ISO 1043-1 Plastics — symbols and abbreviated terms. Part 1: Basic polymers and their special characteristics;
    - (b) ISO 1043-2 Plastics — symbols and abbreviated terms. Part 2: Fillers and reinforcing materials;

- (c) ISO 11469 Plastics — Generic identification and marking of plastic products.

3.4. For the labelling and identification of vehicle elastomer components and materials having a weight of more than 200 grams, the following nomenclature applies:

- (a) ISO 1629 Rubbers and latices — Nomenclature. This shall not apply to the labelling of tyres.

The symbols < or > used in the ISO standards, can be substituted by brackets.

3.5. The vehicle manufacturer shall be required to demonstrate that, through contractual arrangements with his suppliers, management of material and substance restrictions is ensured.

3.6. The vehicle manufacturer shall be required to establish procedures for the following purposes:

- (a) To communicate the applicable requirements to his staff and to all of his suppliers;
- (b) To monitor and ensure that suppliers act in accordance with those requirements;
- (c) To collect the relevant data through the full supply chain;
- (d) To check and verify the information received from suppliers;
- (e) To react adequately where the data received from the suppliers indicate non-compliance with material and substance restrictions.

## Annex 5 - Appendix

### Model of certificate of compliance

CERTIFICATE OF COMPLIANCE  
WITH ANNEX 5 TO REGULATION No. xxx

No. [Reference number]

[..... Competent Authority]

Certifies that

Manufacturer: .....

Address of the manufacturer: .....

complies with the provisions of Annex 5 to Regulation No. xxx

Checks have been performed on:

by (name and address of the Type Approval Authority or Technical Service):

Number of report:

The certificate is valid until [.....date]

Done at [.....Place]

On [.....Date]

[.....Signature]

Attachments: description of the strategy recommended by the manufacturer in the area of reuse, recycling and recovery.



## Annex 6

### Component parts deemed to be non-reusable

1. Introduction

This Annex addresses the component parts of vehicles belonging to category M<sub>1</sub> and those belonging to category N<sub>1</sub> which must not be reused in the construction of new vehicles.

2. List of component parts:

- (a) All airbags, including cushions, pyrotechnic actuators, electronic control units and sensors;
  - (b) Automatic or non-automatic seat belt assemblies, including webbing, buckles, retractors, pyrotechnic actuators;
  - (c) Seats (only in cases where safety belt anchorages and/or airbags are incorporated in the seat);
  - (d) Steering lock assemblies acting on the steering column;
  - (e) Immobilisers, including transponders and electronic control units;
  - (f) Emission after-treatment systems (e.g. catalytic converters, particulate filters);
  - (g) Exhaust silencers.
-