

## **Amendment to UN Regulation No. 39 (Uniform provisions concerning the approval of vehicles with regard to the speedometer and odometer equipment including its installation)**

### **Submitted by the Task Force on UN Regulation No. 39 covering mileage values \***

The text reproduced below was prepared by the Task Force on UN Regulation No. 39 covering mileage values, aiming to amend and supplement the existing requirements for odometers to include provision on:

- accuracy of the on-board odometer mileage values,
- anti-tampering of the on-board odometer mileage values,
- accuracy and anti-tampering of the odometer mileage values displayed to the driver.

It is in accordance with ECE/TRANS/WP.29/GRSG/104 (report of the Working Party on General Safety Provisions on its 125th session), Paragraph 49.

The modifications to the current text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

Colour code:

**Yellow: under discussion**

**Green: adopted**

**Proposal by The Netherlands**

**6th meeting**

**The document is currently drafted as amendment to UNR39 and may be converted to any appropriate legislative format.**

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\* In accordance with the programme of work of the Inland Transport Committee for 2022 as outlined in proposed programme budget for 2022 (A/76/6 (part V, sect. 20) para. 20.76), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## **I. Proposal**

*Paragraphs XX - XX., amend to read:*

## Regulation No. 39

### Uniform provisions concerning the approval of vehicles with regard to the speedometer and odometer equipment including its installation

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## 1. Scope

This Regulation applies to the approval of vehicles of categories L, M and N.<sup>1</sup>

- 1.1. ~~With regards to the anti-tampering and security management of odometers, for vehicles of categories M3 and N3, this Regulation is without prejudice to the application of national and regional legislation on tachographs.~~

~~1.2 This Regulation does not apply for approval of vehicles with regard to the odometer equipment of vehicles fitted with recording equipment used as a data source to measure the mileage of the vehicle and their installation described under paragraph X.X (for vehicles of category N).~~

~~This Regulation does not apply to any trip meter potentially being part of the odometer equipment.~~

## 2. Definitions

For the purposes of this Regulation:

- 2.1. "Approval of a vehicle" means the approval of a vehicle type with regard to the speedometer and odometer equipment including its installation.
- 2.2. "Type of vehicle in respect of its speedometer and odometer" means vehicles which do not among themselves display any essential differences, where those differences can apply, in particular, to the following:
- 2.2.1. The size designation of the tyres chosen from the range of tyres normally fitted;
- 2.2.2. The overall transmission ratio, including any reduction drives, to the speedometer **and odometer**;
- 2.2.3. The type of speedometer as characterised by:
- 2.2.3.1. The tolerances of the speedometer's measuring mechanism;
- 2.2.3.2. The technical constant of the speedometer;
- 2.2.3.3. The range of speeds displayed.
- 2.2.4. The type of odometer as characterised by:
- 2.2.4.1. The technical constant of **the** odometer;
- 2.2.4.2. The number of numerals.
- 2.3. "Tyres normally fitted" means the type or types of tyre provided by the manufacturer on the vehicle type in question; snow tyres shall not be regarded as tyres normally fitted;
- 2.4. "Normal running pressure" means the cold inflation pressure specified by the vehicle manufacturer increased by 0.2 bar;

<sup>1</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, para. 2. - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

- 2.5. "Speedometer" means that part of the speedometer equipment which indicates to the driver the speed of his vehicle at any given moment;<sup>2</sup>
- 2.5.1. "Tolerances of the speedometer's measuring mechanism" shall mean the accuracy of the speedometer instrument itself, expressed as the upper and the lower speed indication limits for a range of speed inputs;
- 2.5.2. "Technical constant of the speedometer" shall mean the relationship between the input revolutions or pulses per minute and a specified displayed speed;
- 2.6. "Odometer" means that part of the odometer equipment which indicates to the driver the total distance recorded / driven by the vehicle since its entry into service.
- 2.6.1. "Technical constant of the odometer" means the relationship between the input revolutions or pulses and the distance travelled by the vehicle.
- 2.6.2. "Total distance indicated" means the distance as displayed by the odometer.
- 2.6.3. "True distance travelled" means the true distance driven by the vehicle for the purpose of the test under Annex 4.
- 2.6.4. "Total distance value" means any mileage value stored on-board the vehicle related to the total distance driven by the vehicle since its entry into service.
- 2.6.5. "Recording equipment" means the equipment intended for installation in road vehicles to display, record, print, store and output data related to the movement of such vehicles (e.g. tachograph). The data recorded includes the effective distances travelled, calibration data of the vehicle and events and faults log.
- The recording equipment consists of a vehicle unit and a motion sensor.
- The vehicle unit communicates with the motion sensor in a secure way.
- 2.6.5.1. "Vehicle unit" means the recording equipment excluding the motion sensor and the cables connecting the motion sensor.
- 2.6.5.2. "Motion sensor" means a part of the recording equipment providing a signal representative of vehicle speed and/or distance travelled.
- 2.7. "Unladen vehicle" means the vehicle in running order, complete with fuel, coolant, lubricant, tools and a spare wheel (if provided as standard equipment by the vehicle manufacturer), carrying a driver weighing 75 kg, but no driver's mate, optional accessories or load.

<sup>2</sup> This does not include the speed-indicating part of a tachograph if this complies with type approval specifications which do not permit an absolute difference between true and indicated speed which is higher than the values resulting from the requirements in paragraph 5.4. below.

**2.8.** **"Tampering Manipulation"** (zzzzz) means any activity aiming at inaccurate recording or misrepresenting of mileage values being stored and/or displayed.

### 3. Application for approval

- 3.1. The application for approval of a vehicle type with regard to the speedometer and odometer equipment including its installation shall be submitted by the vehicle manufacturer or by his duly accredited representative **to the Type Approval Authority of the Contracting Party according to the provisions of Schedule 3 of the 1958 Agreement.**
- 3.2. It shall be accompanied by the following documents **in triplicate and by the following particulars (a model of the information document is given in Annex 5):**
  - 3.2.1. A description of the vehicle type with regard to the items mentioned in paragraphs 2.2., 2.3., 2.4., 2.5. and 2.6. above; the vehicle type shall be specified.
- 3.3. An unladen vehicle representative of the vehicle type to be approved shall be submitted to the technical service conducting approval tests.
- 3.4. The Type Approval Authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type approval is granted.

### 4. Approval

- 4.1. If the vehicle type submitted for approval pursuant to this Regulation meets the requirements of the Regulation in respect of the speedometer and odometer equipment including its installation, approval of that vehicle type shall be granted.
- 4.2. An approval number shall be assigned to each type approved. The first two digits shall be the highest number of the series of amendments incorporated in the Regulation at the time of issue of the approval. The same Contracting Party may not assign the same number to another vehicle type subject to the provisions of paragraph 6. of this Regulation.
- 4.3. Notice of approval or of refusal of approval of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in Annex 1 to this Regulation and of diagrams, supplied by the applicant for approval, of the installation in a format not larger than A4 (210 x 297 mm) or folded to that format, and on an appropriate scale.
- 4.4. To every vehicle conforming to a vehicle type approved under this Regulation there shall be affixed in a conspicuous and easily accessible position, specified on the approval form, an international approval mark consisting of:

- 4.4.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval;<sup>3</sup>
- 4.4.2. 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 4.4.1.
- 4.5. 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 4.4.1. need not be repeated; in such a case the additional numbers and 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 4.4.1.
- 4.6. The approval mark shall be clearly legible and shall be indelible.
- 4.7. The approval mark shall be placed close to or on the vehicle data plate affixed by the manufacturer.
- 4.8. Annex 2 to this Regulation gives examples of arrangements of approval marks.

## 5. Specifications

- 5.1. An onboard speedometer and odometer complying with the requirements of this Regulation shall be fitted to the vehicle to be approved.  
**Speedometer**
- 5.2. The display of the speedometer must be located within the direct field of view of the driver and must be clearly legible both day and night. The range of speeds displayed must be sufficiently wide to include the maximum speed of this type of vehicle as stated by the manufacturer.
  - 5.2.1. In the case of speedometers intended for vehicles of categories M, N, and L<sub>3</sub>, L<sub>4</sub> and L<sub>5</sub>, the graduation shall be 1, 2, 5 or 10 km/h. The numerical values of the speed shall be indicated on the display as follows: when the highest value on the display does not exceed 200 km/h, speed values shall be indicated at intervals not exceeding 20 km/h. When the maximum value on the display exceeds 200 km/h, then the speed values shall be indicated at intervals not exceeding 30 km/h. The indicated numerical speed value intervals need not be uniform.
  - 5.2.2. In the case of vehicles of categories M, N, and L<sub>3</sub>, L<sub>4</sub> and L<sub>5</sub> manufactured for sale in any country where imperial units are used, the speedometer shall also be marked in mph (miles per hour); the graduation shall be of 1, 2, 5 or 10 mph. The numerical values of the speed shall be indicated on the display at intervals not exceeding 20 mph and commencing at 10 or 20 mph. The indicated numerical speed value intervals need not be uniform.
  - 5.2.3. In the case of speedometers intended for vehicles of categories L<sub>1</sub> (mopeds) and L<sub>2</sub>, the display readings must not exceed 80 km/h. The graduation shall be 1, 2, 5 or 10 km/h and the marked numerical values of the speed indicated shall

<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. 6, Annex 3 - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

not exceed 10 km/h. The indicated numerical speed value intervals need not be uniform.

- 5.3. The accuracy of the speedometer equipment shall be tested in accordance with the following procedure:
- 5.3.1. The tyres shall be one of the types normally fitted to the vehicle as defined in paragraph 2.3. of this Regulation. A test shall be carried out for each type of speedometer intended to be fitted by the manufacturer.
- 5.3.2. The test shall be carried out with the vehicle at its unladen weight. An additional weight can be carried for purposes of measurement. The weight of the vehicle and its distribution between the axles shall be indicated in the approval communication (see Annex 1, item 7.);
- 5.3.3. The reference temperature at the speedometer shall be  $23 \pm 5$  °C;
- 5.3.4. During each test the pressure of the tyres shall be the normal running pressure as defined in paragraph 2.4.;
- 5.3.5. The vehicle is tested at the following speeds:

<i>Maximum design speed (V<sub>max</sub>) of the vehicle specified by the vehicle manufacturer (km/h)</i>	<i>Test speed (V<sub>t</sub>) (km/h)</i>
V <sub>max</sub> ≤ 45	80 % of V <sub>max</sub>
45 < V <sub>max</sub> ≤ 100	40 km/h and 80 % V <sub>max</sub> (if the resulting speed is ≥ 55 km/h)
100 < V <sub>max</sub> ≤ 150	40 km/h, 80 km/h and 80 % V <sub>max</sub> (if the resulting speed is ≥ 100 km/h)
150 < V <sub>max</sub>	40 km/h, 80 km/h and 120 km/h

- 5.3.6. The test instrumentation used for measuring the true vehicle speed shall be accurate to  $\pm 0.5$  per cent;
- 5.3.6.1. The surface of a test track when used shall be flat and dry, and provide sufficient adhesion;
- 5.3.6.2. If a roller dynamometer is used for the test, the diameter of the roller should be at least 0.4 m;
- 5.4. The speed indicated shall not be less than the true speed of the vehicle. At the test speeds specified in paragraph 5.3.5. above, there shall be the following relationship between the speed displayed (V<sub>1</sub>) and the true speed (V<sub>2</sub>).

$$0 \leq (V_1 - V_2) \leq 0.1 V_2 + 4 \text{ km/h}$$

**Odometer equipment**

- 5.5. The display of the odometer shall be visible or accessible to the driver. The odometer shall display at least an integer number composed of a minimum of 6 numerals for the vehicles of categories M and N, and at least an integer number composed of a minimum of 5 numerals for the vehicles of category L. Nevertheless, the Type Approval Authorities may also accept an integer



number composed of at least 5 numerals for the vehicles of categories M and N if the intended use of the vehicle justifies it.

- 5.5.1. In the case of vehicles manufactured for sale in any country where imperial units are used, the odometer shall be marked in miles.

**Paragraphs 5.6. to 5.14. apply to vehicles of categories M and N only.**

~~For vehicles fitted with recording equipment used as unique source to measure the mileage, the requirements of paragraphs 5.6. to 5.14. are deemed to be met, if the security and accuracy of the recording equipment are at least of the same level as those of this UN Regulation.~~

#### **Odometer [equipment] - Accuracy**

- 5.6. The accuracy of the odometer equipment shall be tested in accordance with the test procedure prescribed in Annex 4.

- 5.7. The total distance indicated shall not deviate by more than  $\pm 4.0 / \pm 2.5$ % from the **total true** distance travelled as established by paragraph 5.6.

- 5.8. When total distance values are made available through the serial data port on the standardised data link connector specified in paragraph 6.5.1.4 and in accordance with the specifications set out in section 6.5.3 of Appendix 1 of Annex 11 to Regulation No 83 and in accordance with paragraph 4.7.3 of Annex 9B and the reference standard documents set out in Appendix 6 to that Annex to Regulation No 49, and specified in paragraph 6.5.1.3 and in accordance with the specifications set out in section 6.5.3 of Appendix 1 of Annex C5 to Regulation No 154, those values shall not deviate by more than  $\pm 4.0 / \pm 2.5$ % from the **total true** distance travelled as established by paragraph 5.6.

In addition, these values shall not deviate by more than  $\pm 4.0 / \pm 2.5$ % from the total distance indicated.

#### **Odometer - General**

- 5.9. ~~Where total distance indicated and/or total distance values are established by a motion sensor, information from the motion sensor shall be corroborated by vehicle motion information derived from a GNSS receiver or by other source(s) independent from the motion sensor.~~

~~5.9.1. Paragraph 5.9. shall be met by ... frequency, resetting of values, etc.~~

- 5.10. Total distance values and the total distance indicated shall have a resolution better than or equal to 1 km or 1 mile, as appropriate.

- 5.11. In case of repair or replacement of the odometer or any related components, or of any ECU holding total distance values, ...

- 5.12. Where total distance values are stored transmitted off-board the vehicle ... [they shall comply with the provisions of paragraph 5.8. and be accompanied by a time stamp].

- 5.13. A warning signal shall be provided in case of internal malfunction of the odometer or distance measurement. Visual indication of the malfunction shall be displayed during failure. It may be cancelled temporarily, but shall be repeated whenever the ignition or the vehicle master control switch is activated (whatever applicable).

**Commented [HL1]:** To be further discussed in the TF or GRSG; also for L category vehicles, the requirement to have an odometer doesn't make sense if accuracy requirements are lacking.

**Commented [TG2]:** Willen we dit nog aangegeven hebben op het certificaatmodel?

5.13.1. The manufacturer shall provide the Type Approval Authority with an explanation and technical documentation which shows, in overall terms, how the malfunction indication strategy is achieved. This documentation shall be maintained by the manufacturer and shall be made open for inspection by the Technical Service at the time of the type approval.

This shall at least cover the following items:

Table 1 - Template of information for self-test function ...

#### Odometer – Anti-tampering and Security management

5.14. Manufacturers shall design, construct and assemble vehicles in such a way to minimise vulnerabilities, arising in all phases of their life-cycle, that may lead to tampering with the odometer and total distance indicated and total distance values as referenced to in paragraphs 5.7. and 5.8.

5.14.1. The manufacturer shall prevent the possibility of exploiting vulnerabilities referred to in paragraph 5.14. When such a vulnerability is found, the manufacturer shall remove the vulnerability, by software update or any other appropriate means.

5.14.2. The manufacturers shall ensure the secure transmission of data related to total distance values by taking cybersecurity measures in accordance with UN Regulation 155, the Original or any later Series of Amendments.

5.15. Provisions for electronic system security

5.15.1. Manufacturers shall effectively deter reprogramming of the odometer readings, in the board network, in any powertrain controller as well as in the transmitting unit for remote data exchange if applicable. Manufacturers shall include systematic tamper protection strategies and write-protect features to protect the integrity of the odometer reading. Methods giving an adequate level of tamper protection shall be approved by the approval authority.

5.15.2. Paragraph 5.15.1. shall apply to the total distance indicated and all total distance values that are made available through the serial data port on the standardised data link connector specified in paragraph 6.5.1.4 and in accordance with the specifications set out in section 6.5.3 of Appendix 1 of Annex 11 to Regulation No 83 and in accordance with paragraph 4.7.3 of Annex 9B and the reference standard documents set out in Appendix 6 to that Annex to Regulation No 49.

5.15.3. Compliance with paragraph 5.15.1. shall be verified by the test procedure described in Annex 5.

5.14. This paragraph shall apply to vehicles fitted with an odometer with at least one [electronic control unit].

The total distance indicated and total distance values shall be protected against manipulation. This shall be deemed to be complied with when

(a) the manufacturer's cyber security management system complies with the relevant requirements of UN Regulation No. 155, the original or any later series of amendments, and

**(b) the vehicle type complies with the technical requirements of UN Regulation No. 155, the original or any later series of amendments, and when:**

**- manipulation of total distance indicated and total distance values are identified as risks in the vehicle manufacturer's risk assessment, and**

**[- proportionate mitigations are implemented, including mitigation 7 referred to in Annex 5, Part B, Table B5 of UN Regulation 155.]**

## **6. Modifications of the vehicle type**

- 6.1. Every modification of the vehicle type shall be communicated to the Type Approval Authority which approved the vehicle type. The Authority may then either:
  - 6.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the vehicle still meets the requirements; or
  - 6.1.2. Require a further test report from the Technical Service responsible for conducting the tests.
- 6.2. Notice of confirmation or refusal of approval, accompanied by particulars of the modifications, shall be communicated by the procedure specified in paragraph 4.3. above to the Parties to the Agreement applying this Regulation.

## **7. Conformity of production**

- 7.1. The conformity of production procedures shall comply with those set out in the Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3), with the following requirements:
- 7.2. Every vehicle approved under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements of the relevant part(s) of this Regulation.
- 7.3. For each type of vehicle sufficient checks are carried out regarding the speedometer equipment and its installation; in particular, for each type of vehicle at least the test prescribed in Annex 3 to this Regulation shall be carried out.
- 7.4. The Authority, which has granted type approval, may at any time verify the conformity control methods applied in each production facility. The normal frequency of these verifications shall be once every two years.
- 7.5. Where unsatisfactory results are found during verifications and checks pursuant to paragraph 7.4. above, the competent authority shall ensure that all necessary steps are taken to restore conformity of production as rapidly as possible.

**7.6. Placeholder for other provisions**

## **8. Penalties for non-conformity of production**

- 8.1. The approval granted for a vehicle type pursuant to this Regulation may be withdrawn if the requirement laid down in paragraph 7.1. above is not met or if the vehicles have failed to pass the checks prescribed in paragraph 7. above.
- 8.2. If a Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a communication form conforming to the model in Annex 1 to this Regulation.

## **9. Names and addresses of Technical Services responsible for conducting approval tests and of Type Approval Authorities**

The Contracting Parties to the Agreement applying this Regulation shall communicate to the secretariat of the United Nations the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries, are to be sent.

## **10. Transitional provisions**

- 10.1. As from the official date of entry into force of the 01 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept type approvals under this Regulation as amended by the 01 series of amendments.
- 10.2. As from 1 September 2017, Contracting Parties applying this Regulation shall grant new type approvals only if the vehicle type to be approved meets the requirements of this Regulation as amended by the 01 series of amendments.
- 10.3. Contracting Parties applying this Regulation shall not refuse to grant extensions of type approvals for existing types which have been granted according to the preceding series of amendments to this Regulation.
- 10.4. After the date of entry into force of the 01 series of amendments to this Regulation, Contracting Parties applying this Regulation shall continue to accept type approvals granted according to the preceding series of amendments to the Regulation.

## Annex 1

### Communication

Commented [TG3]: updaten?

(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

of a vehicle type with regard to the speedometer and odometer equipment including its installation pursuant to Regulation No. 39.

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

1. Trade name or mark of the vehicle: .....
2. Vehicle type: .....
3. Manufacturer's name and address: .....  
.....
4. If applicable, name and address of the manufacturer's representative: .....  
.....
5. Description of the speedometer equipment: .....
- ~~5.1. Details of tyres normally fitted: .....~~
- ~~5.2. Details of tyres fitted during the test: .....~~
- ~~5.3.1. Ratio of speedometer equipment: .....~~
6. Description of the odometer equipment: .....
- ~~6.1. Ratio of odometer equipment: .....~~

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

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

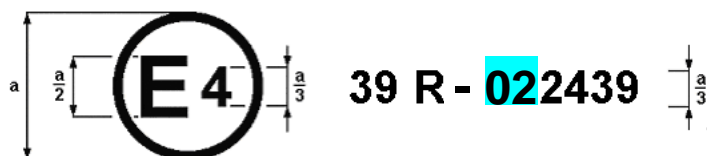
**7. Tyres:**

- 7.1. Details of tyres normally fitted: .....
- 7.2. Details of tyres fitted during the test: .....
- 7.3. Mass of vehicle as tested and its distribution between the axles:  
.....
- 7.4. Variants: .....
- 7.5. Vehicle submitted for approval on: .....
- 7.6. Technical Service responsible for conducting approval tests: .....
- .....
- 7.7. Date of report issued by that Service: .....
- 7.8. Number of report issued by that Service: .....
- 7.9. Approval granted/refused/extended/withdrawn<sup>2</sup>
- 7.10. Position of approval mark on the vehicle: .....
- 7.11. Place: .....
- 7.12. Date: .....
- 7.13. Signature: .....

## Annex 2

### Arrangements of approval marks

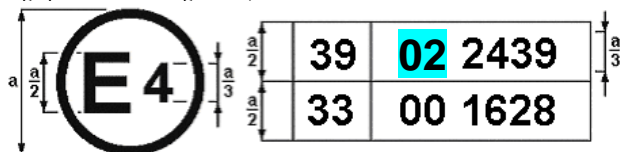
Model A  
 (see paragraph 4.4. of this Regulation)



$a = 8 \text{ mm min.}$

The above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in the Netherlands (E 4), pursuant to Regulation No. 39. The approval number indicates that the approval was granted in accordance with the requirements of UN Regulation No. 39 incorporating the 02 series of amendments.

Model B  
 (see paragraph 4.5. of this Regulation)



$a = 8 \text{ mm min.}$

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. 39 and 33.<sup>1</sup> The approval numbers indicate that, at the dates when the respective approvals were granted, UN Regulation No. 39 incorporated the 02 series of amendments and Regulation No. 33 was still in its original form.

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

## Annex 3

### Test of speedometer accuracy for conformity of production

1. Test conditions

The test conditions shall be as set out in paragraphs 5.3.1. to 5.3.6. of this Regulation.

2. Requirements

The production shall be deemed to conform to this Regulation if the following relationship between the speed indicated on the display of the speedometer ( $V_1$ ) and the actual speed ( $V_2$ ) is observed:

In the case of vehicles of categories M and N:

$$0 \leq (V_1 - V_2) \leq 0.1 V_2 + 6 \text{ km/h};$$

In the case of vehicles of categories L<sub>3</sub>, L<sub>4</sub> and L<sub>5</sub>:

$$0 \leq (V_1 - V_2) \leq 0.1 V_2 + 8 \text{ km/h};$$

In the case of vehicles of categories L<sub>1</sub> and L<sub>2</sub>:

$$0 \leq (V_1 - V_2) \leq 0.1 V_2 + 4 \text{ km/h}.$$



## Annex 4

### Test of odometer accuracy

0. The odometer accuracy indicated in paragraph 5.6. of this Regulation shall be determined as described in this Annex.

In agreement with the Technical Service and Type Approval Authority, alternative test procedures to determine the odometer accuracy may be used, provided it ensures at least the same level of testing accuracy.

#### 1.0. Test procedure

1.1. The accuracy of the odometer equipment shall be tested in accordance with the following procedure:

1.2. The tyres shall be one of the types normally fitted to the vehicle as defined in paragraph 2.3. of this Regulation.

1.3. The test shall be carried out with the vehicle at its unladen weight. An additional weight can be carried for purposes of measurement. The weight of the vehicle and its distribution between the axles shall be indicated in the approval communication (see Annex 1, item 7.).

1.4. The reference temperature at the odometer shall be  $23 \pm 5$  °C (if relevant for the test).

1.5. During each test the pressure of the tyres shall be the normal running pressure as defined in paragraph 2.4.

1.6. The test instrumentation used for measuring the true distance travelled shall be accurate to  $\pm 0.5$  per cent.

1.6.1. The surface of a test track when used shall be flat and dry, and provide sufficient adhesion.

1.6.2. If a roller dynamometer is used for the test, the diameter of the roller should be at least 0.4 m.

1.7. The vehicle is tested at a speed aimed between 50 and 100 km/h. The speed is selected by the Technical Service responsible for carrying out the test based upon the suitability of the road under the conditions given (test track shape, other traffic on track, curves etc.).

1.8. The vehicle is driven until the odometer switches to the next integer. At this point, the instrumentation is set to 0 m.

1.9. the vehicle is driven for 10 kilometres and the true value is read from the instrumentation at the point where the odometer switches to the 10 km integer.

#### 2.0. Test results

2.1. The accuracy shall be calculated as follows:

$$\text{Accuracy [\%]} = \frac{10,000 - \text{Tdt}}{\text{Tdt}} * 100 =$$

With Tdt = True distance travelled

**Example:**

- odometer switches from 3529 to 3530 km; instrumentation is set to 0 m.

- odometer switches from 3539 to 3540; instrumentation reads 10,260 m.

- Accuracy [%] =  $\frac{10,000 - 10,260}{10,260} * 100 = 2.5$  [%]

## Annex 5

### Information document

#### 0. GENERAL

- 0.1. Make (trade name of manufacturer):
- 0.2. Type and general commercial description(s):
- 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:
- 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

#### 2. MASSES AND DIMENSIONS (e) (in kg and mm)

(Refer to drawing where applicable)

- 2.6. Mass of the vehicle in running order (max. and min. for each variant):
- 2.6.1. Distribution of this mass among the axles and, in the case of a semi-trailer or centre axle trailer, load on the coupling point (max. and min):

#### 4. TRANSMISSION (v)

- 4.2. Type (mechanical, hydraulic, electric, etc.):
- 4.5. Gearbox
- 4.5.3. Method of control:
- 4.6. Gear ratios

Gear	Internal gearbox ratios (ratios of engine to gearbox output shaft revolutions)	Final drive ratio(s) (ratio of gearbox output shaft to driven wheel revolutions)	Total gear ratios
Maximum for CVT*			
1			
2			
3			
...			
Minimum for CVT*			
Reverse			

(\*): Continuously variable transmission.

- 4.7. Maximum vehicle speed (in km/h) (w):
- 4.8. Speedometer (in the case of tachograph give approval mark only):
- 4.8.1. Method of operation and description of drive mechanism:

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- 4.8.2 Instrument constant:
  - 4.8.3 Tolerance of the measuring mechanism (pursuant to item 2.1.3 of Annex II to Directive 75/443/EEC):
  - 4.8.4 Overall transmission ratio (pursuant to item 2.1.2 of Annex II to Directive 75/443/EEC) or equivalent data:
  - 4.8.5 Diagram of the speedometer scale or other forms of display:
  - 6. SUSPENSION
  - 6.6 Tyres and wheels
    - 6.6.2 Upper and lower limit of rolling radii
      - 6.6.2.1 axle 1:
      - 6.6.2.2 axle 2:
      - 6.6.2.3 axle 3:
      - 6.6.2.4 axle 4:
    - 6.6.3 Tyre pressures as recommended by the vehicle manufacturer: kPa
  - 7. **Description of recording equipment:**
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