

# Reg 64.00

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UNITED NATIONS  
Regulation No. 64

"UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO THEIR EQUIPMENT WHICH MAY INCLUDE **A TYRE PRESSURE MONITORING SYSTEM**, A TEMPORARY USE SPARE WHEEL AND TYRE UNIT, RUN FLAT TYRES AND/OR A RUN FLAT SYSTEM"

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*(remark; safety)*
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*(remark; CO2)*

## 1. SCOPE

This Regulation applies to the approval of vehicles of category M<sub>1</sub> and N<sub>1</sub> <sup>1/</sup> with regard to their equipment which may include **tyre pressure monitoring systems**, run flat tyres, a run flat system, a spare wheel and tyre unit, other than a "Standard spare unit" as defined in paragraph 2.9. of the Regulation, intended for temporary use in the event of damage to the wheel and tyre unit fitted to the vehicle for normal, long term, road use.

For the purposes of this Regulation, spare wheel and tyre substitute units in the form of run-flat tyres or a run-flat system in a totally deflated condition, are to be treated as being temporary use spare units as defined in paragraph 2.10. of the Regulation.

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<sup>1/</sup> As defined in Annex 7 of the Consolidated Resolution on the Construction of Vehicles (R.E.3) (TRANS/WP.29/78/Rev.1/Amend.2, as last amended by Amend.4).

## 2. DEFINITIONS

For the purpose of this Regulation.

2.1 "Approval of a vehicle" means the approval of a vehicle type with regard to its temporary use spare wheel and tyre unit **and/or tyre pressure monitoring system**.

2.2 "Vehicle type" means a category of vehicles which do not differ significantly in such essential aspects as:

2.2.1 the maximum axle loads of the vehicle, as defined in paragraph 2.10,

2.2.2 the characteristics of the temporary-use spare wheel and tyre unit,

2.2.3 method of drive (front wheel, rear wheel, four wheels),

2.2.4 suspension,

2.2.5 braking system,

2.2.6 wheel size/tyre size;

2.2.7. wheel offset.

**2.2.8. tyre pressure monitoring system**

2.3 "Wheel" means a complete wheel consisting of a rim and a wheel disc;

2.3.1. "Wheel size designation" means a designation comprising at least the nominal rim diameter, the nominal rim width and the rim profile;

2.3.2. "Wheel offset" means the distance from the hub abutment face to the centre line of the rim.

2.4. "Tyre" means a pneumatic tyre, being a reinforced flexible envelope that is provided with, or forms in conjunction with the wheel on which it is mounted, a continuous, essentially toroidal, closed chamber containing a gas (usually air) or a gas and liquid, that is intended normally to be used at a pressure greater than atmospheric pressure. It may be a:

2.4.1. "Normal tyre" being a tyre that is suitable for all normal, on-road, conditions of use;

2.4.2. "Temporary use spare tyre" being a tyre that is specifically designed to be different from a normal tyre and intended only for temporary use under restricted driving conditions;

2.4.3. "Run flat tyre" or "Self supporting tyre" describes a pneumatic tyre structure provided with any technical solutions (for example, reinforced sidewalls, etc.) allowing the pneumatic tyre, mounted on the appropriate wheel and in the absence of any supplementary component, to supply the vehicle with the basic tyre functions, at least, at a speed of 80 km/h (50 mph) and a distance of 80 km when operating in flat tyre running mode;

2.4.4. "Run flat system" or "Extended mobility system" describes an assembly of specified functionally dependant components, including a tyre, which together provide the specified performance granting the vehicle with the basic tyre functions, at least, at a speed of 80 km/h (50 mph) and a distance of 80 km when operating in flat tyre running mode.

~~2.5. "Flat tyre running mode" describes the state of tyre, essentially maintaining its structural integrity, while operating at an inflation pressure between 0 and 70 kPa.~~

*(remark, definition is not necessary anymore, definition RFWS is replaced by TPMS tyre leak allering function; in due time par 2.6 up to 2.18 need to be renumbered)*

2.6. "Basic tyre function" means the normal capability of an inflated tyre in supporting a given load up to a given speed and transmitting the driving, the steering and the braking forces to the ground on which it runs.

2.7. "Tyre size designation" means a combination of figures that uniquely identify the geometric size of the tyre, comprising the nominal section width, the nominal aspect ratio and the nominal diameter. Precise definitions of these features may be found in Regulation No. 30.

2.8. "Tyre structure" means the technical characteristics of the tyre's carcass. This may be bias ply (diagonal or cross ply), bias-belted, radial ply or run flat tyre as further defined in Regulation No. 30.

2.9. "Standard spare unit" means an assembly of a wheel and tyre identical in terms of wheel and tyre size designations, wheel offset and tyre structure to that fitted in the same axle position and to the particular model or version of the vehicle for normal operation. It includes the case of a wheel that is produced from a different material, for example, steel instead of aluminium alloy, that may use different wheel fixing nut or bolt designs but which is otherwise identical to the wheel intended for normal operation.

2.10. "Temporary use spare unit" means an assembly of any wheel and tyre that is not within that defined as a "Standard spare unit" in paragraph 2.9. Temporary use spare units may be of the following types:

2.10.1. Type 1

An assembly in which the tyre is a temporary use spare tyre as defined in paragraph 2.4.2.;

2.10.2. Type 2

An assembly in which the wheel has a different offset from that of the wheel fitted in the same axle position for normal operation of the vehicle;

## 2.10.3. Type 3

An assembly in which the tyre is of a different structure from that fitted in the same axle position for normal operation of the vehicle;

## 2.10.4. Type 4

An assembly in which the tyre is a normal tyre as defined in paragraph 2.4.1. but where the size designation of the wheel or the tyre or both, differ from those of the wheel or tyre fitted in the same axle position for normal operation of the vehicle;

## 2.10.5. Type 5

An assembly in which a wheel and tyre unit as defined in paragraph 2.4.3. or 2.4.4. is fitted to the vehicle for normal, long term road use, but used in an emergency in a totally deflated condition;"

2.11 “Maximum mass” means the maximum value of the vehicle stated by the manufacturer to be technically permissible (this mass may be higher than the “permissible maximum mass” laid down by the national administration);

2.12 “Maximum axle load” means the maximum value, as indicated by the manufacturer, of the total vertical force between the contact surfaces of the tyres or tracks of one axle and the ground and resulting from the part of the vehicle mass supported by that axle; this load may be higher than the “authorized axle load” laid down by the national administration. The sum of the axle loads may be greater than the value corresponding to the total mass of the vehicle;

2.13 “Tyre Pressure Monitoring System” (TPMS) means a system fitted on a vehicle, able to monitor the inflation pressure of the tyres or the variation of this inflation pressure over time and to transmit corresponding information to the user while the vehicle is running.

It consist of a Tyre Leak Alerting Function and eventually a Tyre Pressure Alerting Function

*Remark; “Run Flat Warning System” replaced by the “Tyre Pressure Monitoring System”*

2.14 Tyre Leak Alerting function is a function of the TPMS for detecting that the inflation pressure of one of the tyres in service has significantly changed in comparison to the others and to the initial state, requiring a corrective action

*Remark; in accordance with ISO 21750 definition 3.10, term “function” used because tyre leak alerting is a function within a TPMS*

2.15 Tyre Pressure Alerting function is a function of the TPMS for measuring the tyre inflation pressure [and eventually internal temperature], or (a) parameter(s) that directly correlate(s) to the pressure and delivering an information to the driver that a tyre has reached a level of inflation pressure that requires a corrective action.

*Remark; in accordance with ISO 21750 definition 3.8, term “function” used because tyre pressure alerting is a function within a TPMS*

2.16. “Cold tyre inflation pressure” means the tyre inflation pressure at ambient temperature in absence of any pressure build-up due to tyre usage

2.17 “Recommended cold tyre inflation pressure (Prec)” means the inflation pressure recommended for each tyre position by the vehicle manufacturer for the intended service conditions of the given vehicle

2.18 "Warm tyre inflation pressure" means the tyre pressure at ambient temperature, after pressure build-up due to tyre usage.

### 3. APPLICATION FOR APPROVAL

3.1 The application for approval of a vehicle type with regard to:

- a - a temporary-use spare unit
- b - a tyre pressure monitoring system with or without a Tyre Pressure Alerting function

shall be submitted by the vehicle manufacturer or by his duly accredited representative;

3.2 It shall be accompanied, in triplicate, by a description of the vehicle type with regard to the items specified in annex 1 to this Regulation;

3.3 A vehicle representative of the vehicle type to be approved shall be submitted to the type approval authority or the technical service responsible for conducting the approval tests.

3.4 The competent 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 submitted for approval pursuant to this Regulation meets the requirements of paragraph 5 below, approval of that vehicle type shall be granted.

4.2. An approval number shall be assigned to each type approval. Its first two digits (at present **02** corresponding to the **02** series of amendments) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party may not assign the same number to another type of vehicle. However, variants of a model range which are in separate categories with respect to the criteria of paragraph 2.2 may be covered by the same type approval, provided that the results of the tests described in paragraph 5.2 do not show major differences.

4.3 Notice of approval or of extension 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.

4.4 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:

4.4.1 a circle surrounding the letter "E" followed by the distinguishing number of the country which granted approval; 2/

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 prescribed in paragraph 4.4.1.

4.5 If the vehicle conforms to a vehicle type approved, under one or more Regulations annexed to the Agreement, in the country which granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1 need not be repeated; in such a case, the Regulation and approval numbers and the additional symbols for all the Regulations under which approval has been granted in the country which 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 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 approval marks.

## 5. SPECIFICATIONS AND TESTS

### 5.1 General

5.1.1 Tyres intended for use as part of a temporary use spare unit as defined in paragraph 2.10, shall be approved in accordance with Regulation No. 30

5.1.2 For vehicles having at least four wheels, the load capacity of the temporary-use spare unit shall be at least equal to one half of the highest of the maximum axle loads of the vehicle; if its use is restricted to a specific axle mentioned in the instructions in paragraph 6 below, its load capacity shall be at least equal to one half of the maximum load of that axle.

5.1.3. The design speed of the temporary-use spare unit shall be at least 120 km/h for types 1, 2 and 3

5.1.4 The temporary-use spare unit shall exhibit the following characteristics

5.1.4.1. An 80 km/h maximum speed warning symbol arranged in accordance with the diagram below shall be permanently displayed on the outer face of the wheel in a prominent position.

In the case of vehicles intended to be sold in countries using imperial units of measurement, an additional warning symbol, identical to that described above, with the exception that the figure "80" shall be replaced by "50" and the wording "km/h" by "mph", shall be permanently displayed on the outer face of the wheel in a prominent position.

Alternatively a single warning symbol arranged in accordance with the diagram below, shall be permanently displayed on the outer face of the wheel in a prominent position.

**TEMPORARY USE ONLY**  
**MAXIMUM SPEED**                      **45**  
**80 km/h / 50 mph**

**100**

Upper case letters shall be at least 5 mm high and the numbers "80" and "50" shall be at least 20 mm high with the elements that make up each character of the number at least 3 mm line thickness. Lower case text shall at least have a line height of 5 mm. All text shall be enclosed in a border and be on a background of contrasting colour.

The requirements of this paragraph shall only apply to types 1, 2 and 3 temporary use spare unit as defined in paragraphs 2.10.1., 2.10.2. and 2.10.3.

5.1.4.1.1. An 120 km/h maximum speed warning symbol arranged in accordance with the diagram below shall be permanently displayed on the outer face of the wheel in a

prominent position.

In the case of vehicles intended to be sold in countries using imperial units of measurement, an additional warning symbol, identical to that described above, with the exception that the figure "120" shall be replaced by "75" and the wording "km/h" by "mph", shall be permanently displayed on the outer face of the wheel in a prominent position.

Alternatively a single warning symbol arranged in accordance with the diagram below, shall be permanently displayed on the outer face of the wheel in a prominent position.

**TEMPORARY USE ONLY**  
**MAXIMUM SPEED**                      **45**  
**120 km/h / 75 mph**

**100**

Upper case letters shall be at least 5 mm high and the numbers "120" and "75" shall be at least 20 mm high with the elements that make up each character of the number at least 3 mm line thickness. Lower case text shall at least have a line height of 5 mm. All text shall be enclosed in a border and be on a background of contrasting colour.

The requirements of this paragraph shall only apply to a type 4 temporary use spare unit as defined in paragraph 2.10.4. to be supplied for use on an M1 category vehicle.

5.1.5. Except in the case of a run-flat/self supporting tyres or run-flat/extended mobility system, it is permitted to supply only one temporary use spare unit with the vehicle.

5.1.6. In the case of vehicles equipped with run-flat/self supporting tyres or runflat/extended mobility system the vehicle shall also be fitted with a **Tyre Pressure Monitoring System with at least a Tyre Leak Alerting Function and shall fulfil the requirements of Annex 4.**

5.1.7 **A vehicle equipped with a TPMS and a tyre leak alerting function as declared in paragraph 9.4 of annex 1 shall fulfil the requirements of Annex 4.**

5.1.8 **A vehicle equipped with a TPMS and a tyre pressure alerting function as declared in paragraph 9.4 of annex 1 shall fulfil the requirements of Annex 5.**

5.1.9 **A vehicle equipped with a TPMS and a tyre pressure alerting function as declared in paragraph 9.4 of annex 1 shall also be equipped with a tyre leak alerting function.**

## 5.2 Braking test

5.2.1 Vehicles intended to be equipped with temporary-use spare units shall meet the requirements of annex 3 to this Regulation.

## 6. SUPPLEMENTARY INFORMATION

6.1 The owner's manual of the vehicle shall contain at least the following information:

6.1.1 A statement of the risk resulting from non-compliance with the restrictions on the use of a temporary-use spare unit including, as appropriate, a statement relating to use restricted to a specific axle.

6.1.2. An instruction to drive with caution and at no more than the permitted maximum speed of 80 km/h (50 mph) when a type 1, 2 or 3 temporary-use spare unit as defined

in paragraphs 2.10.1., 2.10.2. or 2.10.3. is fitted, and to reinstall a standard unit as soon as possible. It shall be made clear that this instruction also applies to a type 5 temporary-use spare unit as defined in paragraph 2.10.5. being used in the flat tyre running mode.

6.1.2.1. An instruction to drive with caution and at no more than the permitted maximum speed of 120 km/h (75 mph), when a type 4 spare unit as defined in paragraph 2.10.4. is fitted, and to reinstall a standard unit as soon as possible.

6.1.3 A statement that operation of the vehicle is not permitted with more than one temporary-use spare unit fitted at the same time. This requirement shall only apply to a type 1, 2 and 3 temporary-use spare unit as defined in paragraphs 2.10.1., 2.10.2. and 2.10.3.

6.1.4 A clear indication of the inflation pressure specified by the vehicle manufacturer for the tyre of the temporary-use spare unit.

6.1.5. For vehicles equipped with a temporary use spare unit stored in a deflated condition, a description of the procedure for the tyre to the pressure specified for temporary use by means of the device referred to in paragraph 6.2 below.

6.2. If the vehicle is equipped with a temporary use spare unit stored in a deflated condition, a device must be provided on the vehicle which permits the tyre to be inflated to the pressure specified for temporary use within a maximum of 10 minutes.

6.3 If no owner's manual is supplied with the vehicle, the information required in paragraph 6.1 above shall be displayed in a prominent place on the vehicle.

## 7. MODIFICATIONS AND EXTENSION OF APPROVAL OF THE VEHICLE TYPE

7.1 Every modification of the vehicle type shall be notified to the administrative department which granted the type approval. The department may then either:

7.1.1 Consider that the modifications made are unlikely to have appreciable adverse effects and that in any event the vehicle still complies with the requirements; or

7.1.2 Require a further test report from the technical service responsible for conducting the tests.

7.2 Confirmation or refusal of approval, specifying the alterations, shall be notified by the procedure specified in paragraph 4.3 above to the Parties to the Agreement applying this Regulation.

7.3 The competent authority issuing the extension of approval shall assign a series number to each communication form drawn up for such an extension.

## 8. CONFORMITY OF PRODUCTION

8.1. The Conformity of Production procedures shall comply with those set out in Appendix 2 of the Agreement (E/ECE/324 – E/ECE/TRANS/505/Rev.2), with the following requirements:

8.2. The type approval authority or technical service which has granted type approval, may at any time verify the conformity of production in each production facility. The normal frequency of these verifications shall be at least once per year.

## 9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

9.1 The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 8. are not complied with.

9.2 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 copy of the approval form bearing at the end, in large letters, the signed and dated annotation "APPROVAL WITHDRAWN".

#### 10. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of vehicle approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication that authority shall inform thereof the other Parties to the Agreement applying this Regulation by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation "PRODUCTION DISCONTINUED".

#### 11. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, AND OF ADMINISTRATIVE DEPARTMENTS

The Parties to the Agreement which apply this Regulation shall communicate to the United Nations Secretariat the names and addresses of the technical services responsible for conducting approval tests and of the administrative departments 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.

#### 12. TRANSITIONAL PROVISIONS

12.1. As from the official date of entry into force of the 02 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approval under this Regulation as amended by the 02 series of amendments.

12.2. As from 36 months after the date of entry into force of the 02 series of amendments, Contracting Parties applying this Regulation with respect to the temporary use spare wheels/tyres, run flat tyres or a run flat system shall grant approvals only if the vehicle type to be approved meets the requirements of this Regulation as amended by the 02 series of amendments.

12.3. Contracting Parties applying this Regulation shall not refuse to grant extensions of approval to the preceding series of amendments to this Regulation.

12.4. Contracting Parties applying this Regulation shall continue to grant approvals to those types of vehicles which comply with the requirements of this Regulation as amended by the preceding series during the 36 months' period which follows the date of entry into force of the 02 series of amendments.

12.5. Notwithstanding the transitional provisions above, Contracting Parties whose application of this Regulation comes into force after the date of entry into force of the most recent series of amendments are not obliged to accept approvals which were granted in accordance with any of the preceding series of amendments to this Regulation.

## Footnotes

\*/ Former title of the Agreement:

Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958.

2/ 1 for Germany, 2 for France, 3 for Italy, 4 for Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for the Czech Republic, 9 for Spain, 10 for Serbia, 11 for the United Kingdom, 12 Austria, 13 for Luxembourg, 14 for Switzerland, 15 (vacant), 16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal, 22 for the Russian Federation, 23 for Greece, 24 for Ireland, 25 for Croatia, 26 for Slovenia, 27 for Slovakia, 28 for Belarus, 29 for Estonia, 30 (vacant), 31 for Bosnia and Herzegovina, 32 for Latvia, 33 (vacant), 34 for Bulgaria, 35 (vacant), 36 for Lithuania, 37 for Turkey, 38 (vacant), 39 for Azerbaijan, 40 for The former Yugoslav Republic of Macedonia, 41 (vacant), 42 for the European Community (Approvals are granted by its member States using their respective ECE symbol), 43 for Japan, 44 (vacant), 45 for Australia, 46 for Ukraine, 47 for the Republic of South Africa, 48 for New Zealand, 49 for Cyprus, 50 for Malta, 51 for Republic of Korea, 52 for Malaysia, 53 for Thailand, 54 and 55 (vacant), 56 for Montenegro, 57 (vacant) and 58 for Tunisia. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify or accede to the Agreement Concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approval Granted on the Basis of these Prescriptions, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement."

\*/ The latter number is given as an example only.

1/ This formula corresponds to that prescribed for the braking performance of category M1, vehicles in Regulation No. 13 (document E/ECE/324- E/ECE/TRANS/505/Add.12/Rev.2, Amend 1 and 2; Annex 4, paragraph 3).

Annex 1 - COMMUNICATION  
(maximum format: A 4 (210 x 297 mm))

1/

Communication concerning — the approval,

- the refusal of approval,
- the extension of approval,
- the withdrawal of approval,
- the production definitely discontinued

of a vehicle type with regard to its equipment with temporary-use spare unit, pursuant to Regulation No. 64

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

1. Trade name or mark of the motor vehicle:
2. Vehicle type (if applicable, variants that are included):
3. Manufacturer's name and address
4. If applicable, name and address of the Manufacturer's representative:
5. Vehicle submitted for approval on
6. Technical service responsible for conducting approval tests:
7. Date of test report
8. Number of test report
9. Brief description of the vehicle type:
- 9.1 Mass of the vehicle during the test:

Front axle:

Rear axle:

Total:

- 9.2 Marking and wheel size(s) of standard unit equipment:
- 9.3. Details of temporary use spare unit, including wheel and tyre size designations and marking, tyre load and speed capability, run-flat tyre including the maximum distance wheel offset (where different from standard unit).2/
- 9.4 Tyre Pressure Monitoring System: yes/ no 2/
- 9.4.1 Description of the Tyre Leak Alerting function of the tyre pressure monitoring system 2/
- 9.4.1 Description of the Tyre Pressure Alerting function of the tyre pressure monitoring system 2/

10. Position of approval mark
11. Reason(s) of extension (if applicable)
12. Approval granted/refused/extended/withdrawn: 2/
13. Place
14. Date
15. Signature
16. The list of documents deposited with the Administrative Service which has granted approval is annexed to this communication and which can be obtained upon request.

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1/ Name of Administration.

2/. Strike out what does not apply.

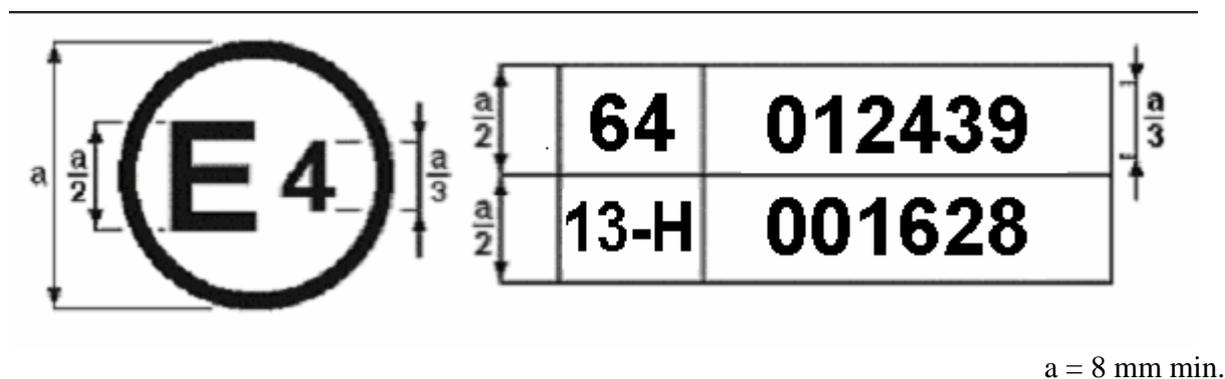
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"Annex 2  
ARRANGEMENTS OF APPROVAL MARKS  
Model A  
(See paragraph 4.4. of this Regulation)



The above approval mark affixed to a vehicle shows that the vehicle type concerned has, with regard to the equipment of temporary-use spare unit(s), been approved in the Netherlands (E 4), pursuant to Regulation No. 64 under approval number 012439. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 64, incorporating the 01 series of amendments.

Model B  
(See paragraph 4.5. of this Regulation)



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. 64 and 13-H. 1/ The approval numbers indicate that, at the dates when the respective approvals were given, Regulation No. 64 included the 01 series of amendments and Regulation No. 13-H was in its original form.

1/ The latter number is given as an example only."

## Annex 3 - BRAKING AND DEVIATION TEST FOR VEHICLES FITTED WITH TEMPORARY-USE SPARE UNITS

### 1. GENERAL CONDITIONS

- 1.1 The test track shall be substantially level and have a surface affording good adhesion.
- 1.2 The test shall be performed when there is no wind liable to affect the results.
- 1.3 The vehicle shall be loaded to its maximum mass as defined in paragraph 2.9 of this Regulation.
- 1.4 The axle loads resulting from the loading condition in accordance with paragraph 1.3 of this annex shall be proportional to the maximum axle loads as defined in paragraph 2.10 of this Regulation.
- 1.5. Except in the case of a run-flat tyre, the tyres shall be inflated to the pressures recommended by the vehicle manufacturer for the vehicle type and loading condition. A run-flat tyre shall be tested in the fully deflated condition.

### 2. BRAKING AND DEVIATION TEST

- 2.1 The test shall be carried out with the temporary-use spare unit fitted alternately in place of one front wheel and one rear wheel. However, if use of the temporary-use spare unit is restricted to a specific axle, the test shall be carried out only with the temporary-use spare unit fitted to that axle.
- 2.2 The test shall be carried out using the service braking system from an initial speed of 80 km/h with the engine disconnected.
- 2.3. The braking performance shall correspond to the test procedure given in Regulation No. 13 or 13-H for categories M1 and N1 vehicles for the Type O cold test with the engine disconnected:"

2.3.1. In the case of M1 category vehicles approved to Regulation No. 13 fitted with type(s) 1, 2, 3 and 5 temporary use spare units as defined in paragraphs 2.10.1., 2.10.2., 2.10.3. and 2.10.5. and tested using a prescribed speed of 80 km/h;

the stopping distance achieved using a maximum force of 500 N applied to the foot control, shall not exceed 50.7 m and;

the mean fully developed deceleration (mfdd) given by the following formula shall be not less than 5.8 ms<sup>-2</sup>:

$$Mfdd = v^2/41.14 s$$

where "v" is the initial speed at which braking commences and "s" is the distance covered during braking between 0.8 v and 0.1 v.

2.3.1.1. In the case of N1 category vehicles approved to Regulation No. 13 fitted with type(s) 1, 2, 3 and 5 temporary use spare units as defined in paragraphs 2.10.1., 2.10.2., 2.10.3. and 2.10.5. and tested using a prescribed speed of 80 km/h;

the stopping distance achieved using a maximum force of 700 N applied to the foot control shall not exceed 61.2 m and;

the mean fully developed deceleration (mfdd) given by the following formula shall be not less than 5.0 ms<sup>-2</sup>:

$$Mfdd = v^2/41.14 s$$

where v is the initial speed at which braking commences and s is the distance covered during braking between 0.8 v and 0.1 v.

2.3.1.2. In the case of M1 category vehicles approved to Regulation No. 13 fitted with type 4 spare unit as defined in paragraph 2.10.4. tested using a prescribed speed of 120 km/h;

the stopping distance achieved using a maximum force of 500 N applied to the foot control, shall not exceed 108 m and;

the mean fully developed deceleration (mfdd) given by the following formula shall be not less than 5.8 ms<sup>-2</sup>:

$$Mfdd = v^2/41.14 s$$

where "v" is the initial speed at which braking commences and "s" is the distance covered during braking between 0.8 v and 0.1 v.

2.3.1.3. In the case of M1 or N1 category vehicles approved to Regulation No. 13-H fitted with type(s) 1, 2, 3 and 5 temporary use spare units as defined in paragraphs 2.10.1., 2.10.2., 2.10.3. and 2.10.5. and tested using a prescribed speed of 80 km/h;

the stopping distance achieved using a maximum force of 650 N + 0 / -50 N applied to the foot control, shall not exceed 46.4 m and;

the mean fully developed deceleration (mfdd) given by the following formula shall be not less than 6.43 ms<sup>-2</sup>:

$$Mfdd = v^2/41.14 s$$

where "v" is the initial speed at which braking commences and "s" is the distance covered during braking between 0.8 v and 0.1 v.

2.3.1.4. In the case of M1 category vehicles approved to Regulation No. 13-H fitted with type 4 temporary use spare unit as defined in paragraph 2.10.4. and tested using a prescribed speed of 120 km/h;

the stopping distance achieved using a maximum force of 650 N + 0 / -50 N applied to the foot control, shall not exceed 98.4 m and;

the mean fully developed deceleration (mfdd) given by the following formula shall be not less than 6.43 ms<sup>-2</sup>:

the stopping distance achieved using a maximum force of 650 N + 0 / -50 N applied to the foot control, shall not exceed 46.4 m and;

the mean fully developed deceleration (mfdd) given by the following formula shall be not less than 6.43 ms<sup>-2</sup>:

$$Mfdd = v^2/41.14 s$$

where "v" is the initial speed at which braking commences and "s" is the distance covered during braking between 0.8 v and 0.1 v.

2.3.1.4. In the case of M1 category vehicles approved to Regulation No. 13-H fitted with type 4 temporary use spare unit as defined in paragraph 2.10.4. and tested using a prescribed speed of 120 km/h;

the stopping distance achieved using a maximum force of 650 N + 0 / -50 N applied to the foot control, shall not exceed 98.4 m and;

the mean fully developed deceleration (mfdd) given by the following formula shall be not less than 6.43 ms<sup>-2</sup>:

$$Mfdd = v^2/41.14 s$$

where "v" is the initial speed at which braking commences and "s" is the distance covered during braking between 0.8 v and 0.1 v.

2.4 Tests shall be carried out for each of the fitting conditions of temporary- use spare units specified in paragraph 2.1 of this annex.

2.5 The prescribed braking performance shall be obtained without any wheel locking, deviation of the vehicle from its intended course, abnormal vibration, abnormal wear of the tyre during the test or excessive steering correction.

Annex 4TYRE PRESSURE MONITORING SYSTEM, tyre leak alerting function

*remark; requirements as discussed during meeting TF in Paris May 30. Annex 4 replaces current R64 Annex 4 regarding RFWS.*

1. Vehicles equipped with a TPMS with a tyre leak alerting function shall be capable of operating within a speed range from [40]km/h to the maximum design speed of the vehicle.
  - 1.1 A TPMS shall function with any tyre type and size specified by the vehicle manufacturer
  - 1.2 The warning indication shall be by means of an optical yellow warning signal conform to regulation N°121.
  - 1.3 The warning signal shall be activated when the ignition (start) switch is in the "on" (run) position (bulb check).
  - 1.4 Electrical failure or sensor anomaly that affects the TPMS, including failure of the electrical source, supply or transmission of the output signal, shall be indicated to the driver by an optical yellow TPMS malfunction signal. The illumination shall be repeated each time the ignition (start) switch is in the "on" (run) position until the failure has been corrected
  - 1.5 If the vehicle's tyre pressure monitoring system has a manual reset feature, the operation shall be explained in detail in the owners manual.

*remark, to make driver aware of his responsibility with regard to the tyre inflation*

- 1.6 A TPMS shall comply with the requirements of Regulation R10 on electromagnetic interferences

2.

When tested according to paragraph 4, the TPMS shall illuminate the warning signal not more than **[10]** minutes after the warm tyre inflation pressure in one of the vehicle's tyres is reduced by **25%**.

*remark; current R64 tyre pressure minus 100 kPa to be indicated within 5 minutes (or with pressure loss of 10 kPa/min up to 20 kPa/min within 10 to 5 minutes respectively)*

- 2.1. The warning signal shall continue to illuminate as long as the pressure in any one of the vehicle's tyres is equal to or less than the pressure specified in paragraph 2 and the ignition (start) switch is in the "on" (run) position whether or not the engine is running;

### 3. Test Conditions

#### 3.1. Ambient temperature

The ambient temperature shall be between 0 °C and 40 °C.

#### 3.2. Test road surface

The test road surface shall be dry and smooth.

#### 3.3. Test location

The test location shall be other than an environment susceptible to radio wave interference such as a strong electric field.

3.4. Condition of the test vehicle in a stationary state. The vehicle's tyres shall be shaded from direct sun when the vehicle is parked.

3.5 All pressure measurements and adjustments shall be performed using a pressure gauge such that the measurement uncertainty is not higher than 3 kPa.

*remark, 3kPa according to an ISO proposal*

#### 4. Test Method

4.1.1 The tyres are to be inflated to the pressure recommended by the vehicle manufacturer.

4.1.2 With the vehicle stationary and the ignition (start) switch in the "Lock" or "Off" position, turn the ignition (start) switch to the "On" ("Run") position or, where applicable, the appropriate key position. Confirm the activation of the warning signal.

4.1.3 Drive the vehicle normally between [40 and 100] km/h for [20] minutes. Turn off the ignition and within 5 minutes reduce the inflation pressure of any one tyre until the adjusted tyre inflation pressure is 25 % below the warm tyre inflation pressure.

4.1.4 Within 1 minute after reducing the inflation pressure of the tyre, drive the vehicle normally between [40 and 130 km/h.]

4.1.5 The test is completed when either:

- (a) the TPMS has illuminated the warning signal
- or,
- (b) a period of [10] minutes has elapsed, when determined in accordance with paragraph 4.3, from the time the test speed has been reached. If the warning does not activate the test has failed.

The vehicle shall be brought to a halt and the ignition switched off.

*remark, 10 minutes as discussed during meeting TF in Paris*

4.1.6 If the warning signal has activated, wait 5 minutes before turning the ignition on; the signal must reactivate and remain active as long as the ignition switch is in the "on" ("run") position.

4.1.7 Repeat the process described in paragraphs 4.1.1 to 4.1.6, but with a test speed of 110 to 130 km/h (or vehicle's maximum speed if lower than 130km/h with a tolerance of – 20 km/h). The requirements in paragraphs 4.1.5 and 4.1.6 shall be met.

#### 4.2. Test procedures for detecting a failure of the TPMS.

4.2.1. With the vehicle in the normal use condition, simulate a TPMS failure. This may be simulated by, for example, disconnecting connectors for wiring related to the power supply from the power source or wiring related to the input/output to/from the warning system control.

4.2.2. With a simulated fault introduced, drive the vehicle normally between 40 and 100 km/h.

4.2.3. When:

- (a) the TPMS malfunction signal has activated
- or,
- (b) a period of 10 minutes has elapsed, when determined in accordance with paragraph 4.3., from the time the test speed has been reached. If the warning does not activate the test has failed,

The vehicle shall be brought to a halt and the ignition switched off.

4.2.4. If the warning signal as required in paragraph 1.2. above has activated, wait 5 minutes before turning the ignition on; the signal must reactivate and remain active as long as the ignition switch is in the "on" ("run") position.

#### 4.3 Calculation of time duration

The time to be taken for determination of the requirements of paragraphs 4.1.5. and 4.2.3. shall be the total elapsed time while the vehicle is driven in the specified test speed range.

The time shall be calculated over a continuous drive but it is not necessary that the vehicle maintains throughout the test a speed within the test speed range. Where the vehicle speed falls outside the test speed range, any time accumulated during such events shall not be considered as part of the total test time duration.

The type approval authority shall satisfy itself that the TPMS records the time within the test speed range on a cumulative basis and does not restart the time calculation if the vehicle falls outside the test speed range."

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## Annex 5

### TYRE PRESSURE MONITORING SYSTEM, tyre pressure alerting function

1 When tested according to paragraph 4, the TPMS shall illuminate the warning signal not more than [60] minutes after the warm tyre inflation pressure in at least one of the vehicle's tyres, up to a total of four tyres, is reduced by [15%]/[20%].

*Remark; 15% is equal to 30 kPa when Prec is 200 kPa. Relative value to compensate the change of the tyre pressure as a result of driving.*

The illumination may be temporary suppressed according the manufacturer's specification to avoid erroneous warning signals.

#### 3. Test Conditions

As in annex 4 par 3.

#### 4. Test Method

In accordance with the manufacturer's specification the TPMS shall be reset and a learning phase performed.

##### 4.1.1 Detection Test :

Inflate vehicle's tyres at the recommended cold tyre inflation pressure Prec

Drive at speeds between 40 and 100 km/h for a period of [20 minutes]

then stop and within [5 minutes] adjust any combination of one to four tyres to a pressure [15/20%] below the warm tyre inflation pressure .

Then within [1 minutes] after adjusting the tyres' pressure drive for another [60 minutes] at a speed between 40 km/h and 100 km/h.

The TPMS shall illuminate a warning signal according the manufacturer's specification at any time during or after the 60 minutes of cumulative driving at 40 km/h or more.

4.1.2. When the warning signal has activated, wait 5 minutes before turning the ignition on; the signal must reactivate and remain active as long as the ignition switch is in the "on" ("run") position.

4.1.3 Keep the vehicle stationary and shaded for a period of up to one hour with the engine off.

4.1.4 Inflate all of the vehicle's tyres to the vehicle manufacturer's recommended cold inflation pressure. If the vehicle's tyre pressure monitoring system has a manual reset feature, reset the system in accordance with the instructions of the vehicle manufacturer. Determine whether the telltale has extinguished. If necessary, drive the vehicle until the telltale has been extinguished.

4.1.5 The test may be repeated with the relevant number of tyres on the vehicle under-inflated

#### 4.2 Calculation of time duration

The time to be taken for determination of the requirements of paragraphs 4.1 shall be the total elapsed time while the vehicle is driven in the test speed range 40 km/h to 100 km/h.

The time shall be calculated over a continuous drive but it is not necessary that the vehicle maintains throughout the test a speed within the test speed range. Where the vehicle speed falls outside the test speed range, any time accumulated during such events shall not be considered as part of the total test time duration.

The type approval authority shall satisfy itself that the TPMS records the time within the test speed range on a cumulative basis and does not restart the time calculation if the vehicle falls outside the test speed range.

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