

Submitted by the expert from the European Commission

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agenda item 9)

Proposal for Amendments of Regulation No. 92

The proposed amendments are written in track change mode, justifications are highlighted in yellow, comments are highlighted in green, references to ISO standards are highlighted in light blue. It should be checked by GRB members, whether these references need to be updated to newer versions of these standards.

Regulation No. 92

Uniform provisions concerning the approval of non-original replacement exhaust silencing systems (**RESSNORESS**) for **vehicles of categories L₁, L₂, L₃, L₄ and L₅ motorcycles, mopeds and three-wheeled vehicles with regard to sound emission**

Comment: The VPSD informal group decided to use the term "RESS" for "rechargeable energy storage system". Therefore, the term "RESS", which was used in this regulation as "replacement exhaust silencer system" needs to be replaced. Since the title of this regulation implies, that it is dedicated to non-original replacement exhaust silencing systems, it is obvious to use the term "NORESS". Consequently, the term "RESS" was replaced by "NORESS" in the whole Regulation. The phrase "motorcycles, mopeds and three wheeled vehicles" was replaced by "vehicles of categories L₁, L₂, L₃, L₄ and L₅" in the whole Regulation in order to bring it in line with the scope. Consequently, the phrase "motorcycle, moped or three wheeled vehicle" was replaced by "vehicle" "with regard to sound emission" was added to be more specific. The term "noise" was replaced by "sound" in the whole regulation except for background noise.

Justification: Eliminate contradiction with VPSD definitions and make the text more comprehensive.

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1. Scope

This Regulation applies to **non-original** replacement exhaust silencing systems for vehicles of categories L₁, L₂, L₃, L₄ and L₅¹.

2. Definitions

For the purpose of this Regulation

2.1. "Non-original replacement exhaust **silencing** system or components of this system" means a system of a type different from that fitted to the vehicle on approval or extension of approval. It may be used only as a replacement exhaust or silencing system.

The acronym NORESS denotes the non-original replacement exhaust silencing system.

2.2. "Non-original replacement exhaust **silencing** system component" means one of the various components which together form the exhaust **silencing** system²;

2.3. "Non-original replacement exhaust **silencing** systems of different types" means silencing systems which differ significantly in such respects as:

- (a) Their components bear different trade names or marks,
- (b) The characteristics of the materials constituting a component are different or the components differ in shape or size; a modification in respect to coating (zinc coating, aluminium coating, etc.) is not considered a change of type,
- (c) The operating principles of at least one component are different,
- (d) Their components are combined differently;

2.4. "Non-original replacement exhaust **silencing** system ~~or component thereof~~" means any part of the exhaust silencing system defined in paragraph 2.1. intended for use on a vehicle other than a part of the type fitted to the vehicle when submitted for type approval pursuant to Regulation No. 9, Regulation No. 41 or Regulation No. 63.

2.5. "Approval of a non-original **replacement silencing system** ~~or component(s) thereof~~" means the approval of the whole or a part of a silencing system adaptable to one or several specified types of motorcycle, moped, ~~or~~ three- **or four**-wheeled vehicle, as regards the limitation of their ~~noise~~ **sound** level;

Justification: The proposed text in 2.1 to 2.5 is more comprehensive than the existing text.

2.6. "~~Motorcycle, moped or three wheeled vehicle type~~"² "Vehicle type" means ~~motorcycles, mopeds or three wheeled~~ vehicles of the categories L₁, L₂, L₃, L₄ or L₅ which do not differ in such essential respects as:

¹ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 2

² Those components are, in particular, the exhaust manifold, the silencer proper, the expansion chamber and the resonator

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- (a) The type of engine (two-stroke or four-stroke with reciprocating or rotary pistons; number and capacity of cylinders; number and type of carburettors or injection systems; arrangement of valves; maximum net power and corresponding engine speed). For rotary piston engines, the cubic capacity should be taken to be double of the volume of the chamber;
 - (b) Drive train, in particular the number and ratios of the gears of the transmission and the final ratio~~Number and ratio of gears~~;

Justification: The proposed text is more comprehensive than the existing text.

- (c) Number, type and arrangement of exhaust silencing systems.

2.7 "Rated engine speed" means the engine speed at which the engine develops its rated maximum net power as stated by the manufacturer.³

The symbol n_{rated} denotes the numerical value of the rated engine speed expressed in revolutions per minute.

Justification: The term "rated engine speed" is used in this Regulation, but was not defined so far.

3. Application for approval

3.1. The application for approval of a ~~RESSNORESS~~ or components thereof shall be submitted by its manufacturer or by his duly accredited representative.

3.2. It shall be accompanied by the under mentioned documents in triplicate and the following particulars:

- (a) A description of the motor cycle type(s) on which the ~~RESSNORESS~~ or components are intended to be fitted, with regard to the items referred to in paragraph 2.6 above. The numbers and/or symbols identifying the engine type and the motor cycle type shall be specified and the motor cycle type approval number, if necessary;
- (b) A description of the complete ~~RESSNORESS~~ showing the relative position of each of its components, together with instructions for their assembly;
- (c) Detailed drawings of each ~~RESSNORESS~~ component to enable it to be easily located and identified, and specification of the materials used. These drawings shall also indicate the location for the mandatory affixing of the approval number.

3.3. At the request of the Technical Service conducting the tests for approval, the manufacturer of the ~~RESSNORESS~~ shall submit:

- (a) Two samples of the ~~RESSNORESS~~ or its components submitted for approval;
- (b) A sample of the original exhaust silencing system with which the motor cycle was equipped when submitted for type approval;

³ If the rated maximum net power is reached at several engine speeds, the rated engine speed is used in this Regulation as the highest engine speed at which the rated maximum net power is reached.

(c) A test ~~motor-eye~~vehicle representative of the type to which the ~~RESSNORESS~~ is to be fitted; ~~-. this-~~This ~~motor-eye~~vehicle, when measured for ~~noisesound~~ emission according to the methods described in Annex 3 (including all relevant amendments) to Regulation No. 9, Regulation No. 41 or Regulation No. 63 shall satisfy the following conditions:

(i) If the ~~motorcycle, moped or three-wheeled~~ vehicle is of a type for which approval has been issued pursuant to the requirements of each of Regulations Nos. 9, 41 or 63:

a. The sound level, during the test in motion shall not exceed the ~~specified~~limit ~~specified in the appropriate Regulation~~ by more than 1 dB(A);

Justification: More precise text.

b. The sound level during the stationary test shall not exceed by more than 3 dB(A), the level determined during the approval and indicated on the manufacturer's plate.

(ii) If the ~~motorcycle, moped or three-wheeled~~ vehicle is not of the type for which approval has been issued pursuant to the requirements of the ~~appropriate~~ Regulation, the sound level shall not exceed by more than 1 dB(A) the limit applicable at the time when it was first put on the road.

Justification: More precise text.

4. Markings

4.1. Each component of the ~~RESSNORESS~~, excluding pipes and fitting accessories, shall bear:

(a) The trade name or mark of the manufacturer of the ~~RESSNORESS~~ of its components;

(b) The commercial designation given by the manufacturer.

4.2. These markings shall be clearly legible and indelible and also visible in the position at which the ~~RESSNORESS~~ is fitted.

4.3. The ~~RESSNORESS~~ shall be labelled by its manufacturer; indicating the type(s) of motor cycle(s) for which it has been granted the approval.

4.4. A component may carry several approval numbers if it has been approved as a component of several replacement exhaust systems.

4.5. The replacement exhaust system shall be supplied in a packaging or carry a label both providing the following particulars:

(a) The trade name or mark of the manufacturer of the replacement silencing system and its components,

(b) The address of the manufacturer or his representative,

(c) A list of vehicle models for which the replacement silencing system is intended.

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- 4.6. The manufacturer shall provide:
- (a) Instructions explaining in detail the correct method of mounting on the vehicle,
 - (b) Instructions for handling the silencing system,
 - (c) A list of components with the numbers of the corresponding parts, excluding retainers.
- 4.7. The approval mark.

5. Approval

- 5.1. If the **RESSNORESS** or component thereof submitted for approval under this Regulation meets the requirements of paragraph 6. below, approval for that type shall be granted.
- 5.2. An approval number shall be assigned to each **RESSNORESS** type approved. Its first two digits (at present 01 corresponding to the 01 series of amendments to the Regulation) 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 **RESSNORESS** or component designed for, the same type(s) of motor cycle.
- 5.3. Notice of approval or extension or refusal of approval of a **RESSNORESS** or component thereof under 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.
- 5.4. There shall be affixed to every **RESSNORESS** and component thereof conforming to a type approved under this Regulation an international approval mark consisting of:
- (a) A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval⁴;
 - (b) The number of this Regulation, followed by the letter "R", a dash and the approval number to the right of the circle prescribed in (a) above;
 - (c) The approval number shall be indicated in the approval form, together with the method used for the approval tests.
- 5.5. The approval mark shall be easily legible when the **RESSNORESS** is fitted to the vehicle, and shall be indelible.
- 5.6. A component may be marked with more than one approval number if it has been approved as a part of more than one **RESSNORESS**; in this case the circle need not be repeated. Annex 2 to this Regulation gives an example of the approval mark.

⁴ 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.1 - www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html

6. Specifications

6.1. General specifications

The silencer shall be designed, constructed and capable of being mounted so that:

- (a) The ~~motor-cycle~~vehicle complies with the requirements of this Regulation under normal conditions of use, and in particular regardless of any vibrations to which it may be subjected;
- (b) It displays reasonable resistance to the corrosion phenomena to which it is exposed, with due regard to the normal conditions of use of the motor cycle;
- (c) The ground clearance provided by the silencer originally fitted, and the possible inclined position of the motor cycle, are not reduced;
- (d) Unduly high temperatures do not exist at the surface;
- (e) Its edges are not sharp or jagged and there is sufficient space for shock absorbers and springs;
- (f) Adequate clearance of spring parts is provided;
- (g) Adequate safety clearance of pipes is provided;
- (h) It is tamper-resistant in a way that is compatible with clearly-defined maintenance and installation requirements;

~~(i) Additional prescriptions related to tamper ability and manually adjustable multimode exhaust or silencing systems:~~

~~i. All exhaust or silencing systems shall be constructed in a way that does not easily permit removal of baffles, exit cones and other parts whose primary function is as part of the silencing/expansion chambers. Where incorporation of such a part is unavoidable, its method of attachment shall be such that removal is not facilitated easily (e.g. with conventional threaded fixings) and should also be attached such that removal causes permanent/ irrecoverable damage to the assembly.~~

Comment: The text above was moved to the new paragraph 6.3.1

~~ii. Exhaust or silencing systems with multiple, manually adjustable operating modes shall meet all requirements in all operating modes. The reported noise levels shall be those resulting from the mode with the highest noise levels~~

Comment: The text above was moved to the new paragraph 6.3.2

6.2. Specifications regarding sound levels

The acoustic efficiency of the **RESSNORESS** or components thereof shall be verified by means of the methods described in Regulation Nos. 9, 41 or 63.

In particular, for the application of this paragraph reference shall be made to the series of amendments to Regulation No. 92 which was in force at the time of type approval of the new vehicle. When the **RESSNORESS** or its components is fitted to the ~~motorecycle, moped or three-wheeled~~ vehicle

described in paragraph 3.3. (c), the sound level values obtained using the two methods (stationary and ~~running~~ vehicle in motion) shall satisfy the following condition:

They shall not exceed the values measured in conformity with the requirements of paragraph 3.3.(c), for the same ~~moped, motorcycle, or three-wheeled~~ vehicle when fitted with the original silencing system during ~~either the running test of the vehicle in motion, and~~ the stationary test.

6.3 Additional requirements

6.3.1. Tampering protection provisions

The NORESS or its components shall be constructed in a way that does not easily permit removal of baffles, exit-cones and other parts whose primary function is as part of the silencing/expansion chambers. Where incorporation of such a part is unavoidable, its method of attachment shall be such that removal is not facilitated easily (e.g. with conventional threaded fixings) and should also be attached such that removal causes permanent / irrecoverable damage to the assembly.

6.3.2. Manually adjustable multi-mode NORESS

NORESS with multiple, manually adjustable operating modes shall meet all requirements in all operating modes. The reported sound levels shall be those resulting from the mode with the highest sound levels.

6.3.3 Prohibition of defeat devices

The NORESS manufacturer shall not intentionally alter, adjust or introduce any device or procedure solely for the purpose of fulfilling the noise emission requirements of this Regulation, which will not be operational during typical on-road operation.

6.3.4 Additional sound emission provisions

Furthermore, the requirements of paragraph 6.3.4 of Regulation Nos. 9 or 63 or paragraphs 6.3 of Regulation 41, whatever is applicable, must also be fulfilled for the NORESS.

If tests are to be performed, the vehicle as described in paragraph 3.3.(c) shall be used.

The approval authority may require any relevant test to verify the compliance of the NORESS to these requirements.

The manufacturer shall provide a statement in conformity with annex 4 of this regulation, that the NORESS or components to be approved comply with the additional sound emission provision requirements of paragraph 6.3.4 of Regulation Nos 9 or 63 or paragraph 6.3 of Regulation 41-04, whatever is applicable.

Justification: Alignment of the structure of Regulation 92 with the structure of Regulations 9 and 63. The prohibition of defeat devices and the ASEP requirements should also be made mandatory for NORESS.

6.34. Measurement of vehicle performance

6.34.1. The ~~RESS~~NORESS or its components shall be such as to ensure that the ~~motor-eyel~~vehicle's performance is comparable with that achieved with the original exhaust silencing system or components thereof.

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- 6.34.2 The **RESSNORESS** or, at the manufacturer's choice, the components thereof shall be compared with an original silencing system or components, also in new condition, successively fitted to the ~~motor-cycle~~vehicle referred to in paragraph 3.3.(c).
- 6.34.3. The verification shall be carried out by measuring the output curve in accordance with paragraph 6.3.4.1. or 6.3.4.2. The maximum power and the **engine speed at** maximum power ~~speed~~ measured with the **RESSNORESS** shall not exceed the net power and the speed measured under the conditions set out below with the original equipment exhaust system by more than ± 5 per cent.
- 6.34.4. Test method
- 6.34.4.1. Engine test method
- The measurements shall be carried out on the engine referred to in paragraph 3.3. (d) **comment paragraph 3.3.(d) does not exist** or, if it is not available, on the engine of the ~~motor-cycle~~vehicle referred to in paragraph 3.3.(c), the engine being in both cases mounted on a dynamometer.
- 6.34.4.2. ~~Motor-cycle~~Vehicle test method
- The measurements shall be carried out on the ~~motor-cycle~~vehicle referred to in paragraph 3.3. (c). The values obtained with the original silencing system shall be compared with those obtained with the **RESSNORESS**. The test shall be conducted on a roller dynamometer.
- 6.45. Additional provisions regarding the **RESSNORESS** or its components filled with fibrous materials
- The use of fibrous absorbent material shall be permitted in the construction of the **RESSNORESS** only if the requirements in Annex 3 are met.
- 6.56. Evaluation of the emission of pollutants of vehicles equipped with replacement silencer system
- The vehicle referred to in paragraph 3.3-(c) exhaust silencing system (**RESSNORESS**) of the type for which approval is requested, shall fulfil the pollution requirements according to the type approval of the vehicle. The evidence shall be documented in the test report.

7. **Modification and extension of the approval of **RESSNORESS** and extension of approval**

- 7.1. Every modification of the type of **RESSNORESS** or its components shall be notified to the Type Approval Authority which approved the type of **RESSNORESS**. The said Authority may then either:
- (a) Consider that the modifications made are unlikely to have an appreciable adverse effect, or
 - (b) Require a further test report from the Technical Service responsible for conducting the tests.
- 7.2. The manufacturer of the **RESSNORESS** or component thereof or his duly accredited representative may ask the Type Approval Authority which has granted the approval of the **RESSNORESS** for one or several **vehicle** types ~~of motorcycle, moped or three-wheeled vehicle~~ for an extension of the

approval to other ~~vehicle types of motorcycle, moped or three wheeled vehicle~~. The procedure shall be as described in paragraph 3. above.

- 7.3. Confirmation or refusal of approval, specifying the modifications, shall be communicated in accordance with the procedure specified in paragraph 5.3. above to the Contracting Parties to the Agreement applying this Regulation.
- 7.4. 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

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

- (a) The ~~RESSNORESS~~ approved to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set out in paragraph 6. above.
- (b) The holder of the approval shall ensure that for each type of ~~RESSNORESS~~ at least the tests prescribed in paragraph 6. of this Regulation are carried out.
- (c) 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.
- (d) The production is considered to conform to the requirements of this Regulation, if the provisions of Regulations Nos. 9, 41 and 63, corresponding to the type of vehicle, are complied with and if the sound level measured by the method described in the given Regulations during the test in motion does not exceed by more than 3 dB(A) the sound level measured during the type approval and does not exceed by more than 1 dB(A) the limits prescribed in Regulations Nos. 9, 41 and 63 as applicable.

9. Penalties for non-conformity of production

- 9.1. The approval granted in respect of a type of ~~RESSNORESS~~ or its components under this Regulation may be withdrawn if the requirements laid down in paragraph 8. above are not complied with, or if the ~~RESSNORESS~~ or its components fail to pass the tests provided for in paragraph 8.(b) above.
- 9.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties to the 1958 Agreement applying this Regulation, by means of a communication form conforming to the model contained in Annex 1 to this Regulation.

10. Production definitively discontinued

If the holder of the approval completely ceases to manufacture a type of replacement silencing system or components thereof in accordance with this Regulation, he shall so inform the authority which granted the approval which shall in turn inform thereof the other Contracting Parties to the 1958 Agreement applying this Regulation, by means of a copy of the communication form conforming to the model contained in Annex 1 to this Regulation.

11. Names and addresses of Technical Services responsible for conducting approval tests, and of Type Approval Authorities

The Contracting Parties to the 1958 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 Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, or production definitively discontinued issued in other countries, are to be sent.

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6. Transmission
 - 6.1. Type of transmission: non-automatic gearbox/automatic gearbox:
 - 6.2. Number of gears:
 7. Equipment
 - 7.1. Exhaust silencer
 - 7.1.1. Manufacturer or authorized representative (if any):
 - 7.1.2. Model:
 - 7.1.3. Type: in accordance with drawing No.
 - 7.2. Intake silencer
 - 7.2.1. Manufacturer or authorized representative (if any):
 - 7.2.2. Model:
 - 7.2.3. Type: in accordance with drawing No.
 8. Gears used for test of motor cycle in motion:
 9. Final drive ratio(s):
 10. ECE type approval number of tyre(s):
If not available, the following information shall be provided:
 - 10.1. Tyre manufacturer:
 - 10.2. Commercial description(s) of the type of tyre (by axle), (e.g. trade name, speed index, load index):
 - 10.3. Tyre size (by axle):
 - 10.4. Other type approval number (if available):
 11. Masses
 - 11.1. Maximum permissible gross weight: kg
 - 11.2. Test mass: kg
 - 11.3. Power to mass ratio index (*PMR*):
 12. Vehicle length: m
 - 12.1. Reference length l_{ref} : m
 13. Vehicle speeds of measurements in gear (i)
 - 13.1. Vehicle speed at the beginning of the period of acceleration (average of 3 runs) for gear (i): km/h
 - 13.2. Pre-acceleration length for gear (i): m
 - 13.3. Vehicle speed v_{PP} (average of 3 runs) for gear (i): km/h
 - 13.4. Vehicle speed v_{BB} (average of 3 runs) for gear (i): km/h
 14. Vehicle speeds of measurements in gear (i+1) (if applicable)
 - 14.1. Vehicle speed at the beginning of the period of acceleration (average of 3 runs) for gear (i+1): km/h
 - 14.2. Pre-acceleration length for gear (i+1): m

- 14.3. Vehicle speed $v_{PP'}$ (average of 3 runs) for gear (i+1): km/h
- 14.4. Vehicle speed $v_{BB'}$ (average of 3 runs) for gear (i+1): km/h
- 15. Accelerations are calculated between lines AA' and BB'/PP' and BB'
- 15.1. Description of functionality of devices used to stabilize the acceleration (if applicable):
- 16. **NoiseSound** levels of moving vehicle
- 16.1. Wide-open-throttle test result L_{wot} : db(A)
- 16.2. Constant speed test results L_{crs} : db(A)
- 16.3. Partial power factor k_p : db(A)
- 16.4. Final test result L_{urban} : db(A)
- 17. **NoiseSound** level of stationary vehicle
- 17.1. Position and orientation of microphone (according to Appendix 2 of Annex 3 of 04 series of regulation No. 41):
- 17.2. Test result for stationary test: db(A) at min^{-1}
- 18. Additional sound emission provisions:
See manufacturer's statement of compliance (attached)
- 19. In-use compliance reference data
- 19.1. Gear (i) or, for vehicles tested with non-locked gear ratios, the position of the gear selector chosen for the test:
- 19.2. Pre-acceleration length l_{PA} : m
- 19.3. Vehicle speed at the beginning of the period of acceleration (average of 3 runs) for gear (i): km/h
- 19.4. Sound pressure level $L_{wot(i)}$: dB(A)
- 20. Deviations in calibration of sound level meter: dB(A)
- 21. Date of submission of vehicle for approval:
- 22. Technical Service performing the approval tests:
- 23. Date of report issued by that Service:
- 24. Number of report issued by that Service:
- 25. Approval granted/extended/refused/withdrawn²:
- 26. Position of approval mark on the motor cycle:
- 27. Place:
- 28. Date:
- 29. Signature:
- 30. The following documents, bearing the approval number shown above, are annexed to this communication:
Drawings, diagrams and plans of the engine and of the **noisesound** reduction system;

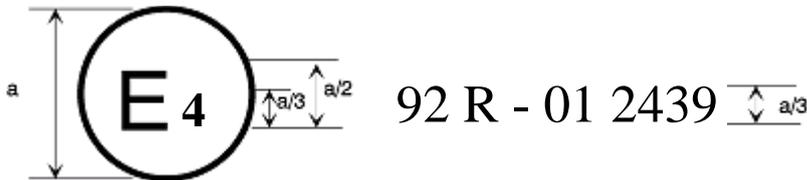
Photographs of the engine and of the exhaust or silencing system;

List of components, duly identified constituting the ~~noisesound~~ reduction system.

Annex 2

Example of the approval marks

(See paragraph 5.4. of this Regulation)



$a = 8 \text{ mm min}$

The above approval mark affixed to a component of silencing systems shows that the replacement silencing system type concerned has been approved in the Netherlands (E4) pursuant to Regulation No. 92 under approval No. 012439. The first two digits of the approval number 01 indicate that the approval was granted in accordance with the requirements of this current Regulation No. 92 whilst the approval number 00 indicate that the approval was granted in accordance with the requirements of Regulation No. 92 in its original form.

Annex 3

Requirements for fibrous absorbent materials used in **RESSNORESS**

(See paragraph 6.4. of this Regulation)

1. Fibrous absorbent material shall be asbestos-free and may be used in the construction of silencers only if suitable devices ensure that the fibrous absorbent material is kept in place for the whole time that the silencer is being used and it meets the requirements of any one of sections 2, 3 or 4 according to the manufacturer's choice.
2. After removal of the fibrous material, the sound level shall comply with the requirements of paragraph 6.2. of this Regulation
3. The fibrous absorbent material may not be placed in those parts of the silencer through which the exhaust gases pass and shall comply with the following requirements:
 - (a) The material shall be heated at a temperature of $650 \pm 5^{\circ}\text{C}$ for four hours in a furnace without reduction in average length, diameter or bulk density of the fibre.
 - (b) After heating at $650 \pm 5^{\circ}\text{C}$ for one hour in a furnace, at least 98 per cent of the material shall be retained in a sieve of nominal aperture size 250 μm complying with ISO 3310/1 when tested in accordance with ISO 2599.
 - (c) The loss in weight of the material shall not exceed 10.5 per cent after soaking for 24 hours at $90 \pm 5^{\circ}\text{C}$ in a synthetic condensate of the following composition:
 - (i) 1 N hydrobromic acid (HBr), 10 ml
 - (ii) 1 N sulphuric acid (H_2SO_4), 10 ml
 - (iii) Distilled water to make up to 1,000 ml

Note: The material shall be washed in distilled water and dried for one hour at 105°C before weighing.
4. Before the system is tested in accordance with paragraph 6.2. of this Regulation it shall be put into a normal state for road use by ~~one of the following~~ conditioning methods in accordance with ~~and as described in the manufacturer's choice in accordance with the Appendix~~ paragraph 5.1.4 of annex 3 of Regulation Nos 9 or 63 or in paragraph 1.3 of annex 5 of Regulation 41, whatever is applicable.

Justification: The appendix is dedicated to L3 category vehicles, but the requirements should also be fulfilled for the other L category vehicles falling under the scope of this Regulation. Therefore, the appendix was deleted and replaced by a reference to the appropriate Regulation.

Appendix

Conditioning methods

1. Test procedures

1.1. Motorcycles

1.1.1. According to the classes of motor cycles, the minimum distances to be completed during conditioning shall be in accordance with Table 1.

Table 1

Class of motor cycle and minimum distance to be completed during conditioning

<i>Class of motorcycle according to Power to Mass ratio index (PMR)</i>	<i>Distance (km)</i>
≤ 25	4,000
$> 25 \leq 50$	6,000
> 50	8,000

(a) 50 per cent \pm 10 per cent of this conditioning cycle consists of town driving and the remainder of long-distance runs at high speed; the continuous road cycle may be replaced by a corresponding test track programme.

(b) The two speed modes shall be alternated at least six times.

(c) The complete test programme shall include a minimum of 10 breaks of at least three hours' duration in order to reproduce the effects of cooling and condensation.

~~1.2. Mopeds~~

~~1.2.1. The minimum distance to be covered during conditioning shall be 2,000 km.~~

~~1.2.2. 50 per cent + 10 per cent of this conditioning cycle shall consist of town driving and the remainder of long distance runs; the continuous road cycle may be replaced by a corresponding test track programme.~~

~~1.2.3. The two speed regimes shall be alternated at least six times.~~

~~1.2.4. The complete test programme shall include a minimum of 10 breaks of at least three hours duration in order to reproduce the effects of cooling and condensation.~~

~~1.3. Three wheeled vehicles~~

~~1.3.1. Depending on the category of vehicle, the minimum distance to be completed during conditioning shall be in accordance with Table 2.~~

Table 2

Category of vehicle and minimum distance to be completed during conditioning

<i>Category of vehicle according to cylinder capacity (cc)</i>	<i>Distance (km)</i>
≤ 250	4,000
$> 250 \leq 500$	6,000
> 500	8,000

1.3.2.50 per cent + 10 per cent of this conditioning cycle shall consist of town driving and the remainder of long distance runs at high speed; the continuous road cycle may be replaced by a corresponding test track programme.

1.3.3. The two speed regimes shall be alternated at least six times.

1.3.4. The complete test programme shall include a minimum of 10 breaks of at least three hours duration in order to reproduce the effects of cooling and condensation.

2. ~~Conditioning by pulsation~~

2.1. The exhaust system or components thereof shall be fitted to the motorcycle or to the engine. In the former case, the motorcycle shall be mounted on a roller dynamometer. In the second case, the engine shall be mounted on a test bench.

The test apparatus, a detailed diagram of which is shown in Figure 1, is fitted at the outlet of the exhaust system. Any other apparatus providing equivalent results is acceptable.

2.2. The test equipment shall be adjusted so that the flow of exhaust gases is alternatively interrupted and restored 2,500 times by a rapid action valve.

~~2.3. The valve shall open when the exhaust gas back pressure, measured at least 100 mm downstream of the intake flange, reaches a value of between 0.35 and 0.40 bar. Should such a figure be unattainable because of the engine characteristics, the valve shall open when the gas back pressure reaches a level equivalent to 90 per cent of the maximum that can be measured before the engine stops. It shall close when this pressure does not differ by more than 10 per cent from its stabilized value with the valve open.~~

~~2.4. The time delay switch shall be set for the duration of exhaust gases calculated on the basis of the requirements of paragraph 4.2.3 above.~~

~~2.5. Engine speed shall be 75 per cent of the speed (S) at which the engine develops maximum power.~~

~~2.6. The power indicated by the dynamometer shall be 50 per cent of the full throttle power measured at 75 per cent of engine speed (S).~~

~~2.7. Any drainage holes shall be closed off during the test.~~

~~2.8. The entire test shall be completed within 48 hours. If necessary, a cooling period shall be allowed after each hour.~~

~~3. ———— Conditioning on a test bench~~

~~3.1. The exhaust system shall be fitted to an engine representative of the type fitted to the motorcycle for which the system is designed, and mounted on a test bench.~~

~~3.2. ———— Motorcycles~~

~~3.2.1. Conditioning consists of the specified number of test bench cycles for the class of motor cycle for which the exhaust system was designed. The number of cycles for each class of motor cycle shall be in accordance with Table 3.~~

~~Table 3~~

~~Number of cycles for each class of motorcycle~~

<p><i>Class of motoreyele</i></p> <p><i>according to Power to Mass ratio index (PMR)</i></p>	<p><i>No. of</i></p> <p><i>e</i></p> <p><i>y</i></p> <p><i>e</i></p> <p><i>t</i></p> <p><i>e</i></p> <p><i>s</i></p>
<p>≤ 25</p>	<p>6</p>
<p>$> 25 \leq 50$</p>	<p>9</p>
<p>> 50</p>	<p>12</p>

3.2.2. Each test bench cycle shall be followed by a break of at least six hours in order to reproduce the effects of cooling and condensation.

3.2.3. Each test bench cycle consists of six phases. The engine conditions for and the duration of each phase shall be in accordance with Table 4.

Table 4

Engine conditions for and the duration of each phase for motoreycles

<p><i>P</i></p>	<p><i>Conditions</i></p>	<p><i>Duration of phase</i></p> <p><i>(in minutes)</i></p>	
<p>-</p>	<p>-</p>	<p>PM</p>	<p>PMR > 50</p>

P	Conditions	Duration of phase (in minutes)	
		M	S
1	Idling	6	6
2	25% load at 75% S	40	50
3	50% load at 75% S	40	50
4	100% load at 75% S	30	40
5	50% load at 100% S	12	12
6	25% load at 100% S	22	22
-	Total Time	150	150

3.2.4. During this conditioning procedure, at the request of the manufacturer, the engine and the silencer may be cooled so that the temperature recorded at a point not more than 100 mm from the exhaust gas outlet does not exceed that measured when the motor cycle is running at 110 km/h or 75 per cent of S in top gear. The engine and/or motor cycle speeds are determined to within ± 3 per cent.

3.3. Mopeds

3.3.1. Conditioning consists of three test cycles.

3.3.2. Each test bench cycle shall be followed by a break of at least six hours' duration in order to reproduce the effects of cooling and condensation.

3.3.3. Each test bench cycle shall consist of six phases. The engine conditions for the duration of each phase shall be as given in Table 5.

Table 5

Engine conditions for the duration of each phase for mopeds

<i>Phase</i>	<i>Engine Conditions</i>	<i>Duration of phase (minutes)</i>
1	Idling	6
2	25% load at 75% S	40
3	50% load at 75% S	40
4	100% load at 75% S	30
5	50% load at 100% S	12
6	25% load at 100% S	22

<i>p</i>	<i>H</i> <i>e</i> <i>s</i> <i>e</i> Conditions	Duration of phase (minutes)
-	Total Time	150

3.3.4. During this conditioning procedure, at the request of the manufacturer, the engine and the silencer may be cooled so that the temperature recorded at a point not more than 100 mm from the exhaust gas outlet does not exceed that measured when the moped is running at 75 per cent of S in top gear. The engine and/or moped speeds shall be determined to within ± 3 per cent.

3.4. ~~Three-wheeled vehicles~~

3.4.1. Conditioning shall consist of the specified number of test bench cycles for the category of vehicle for which the exhaust system was designed. The number of cycles for each vehicle category shall be as given in Table 6.

Table 6

~~Number of cycles for each vehicle category for three-wheeled vehicles~~

<i>Category of vehicle</i> <i>by to cylinder capacity (cc)</i>	<i>No. of cycles</i>
≤ 250	6
$> 250 \leq 500$	9
> 500	12

3.4.2. Each test bench cycle shall be followed by a break of at least six hours' duration in order to reproduce the effects of cooling and condensation.

3.4.3. Each test bench cycle shall consist of six phases. The engine conditions for and the duration of each phase shall be as given in Table 7.

Table 7

Engine conditions for the duration of each phase for three wheeled vehicles

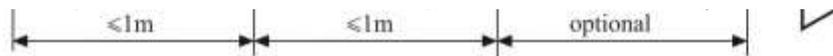
	<i>Conditions</i>	<i>Duration of phase (minutes)</i>	
		<p>Engine</p> <p>Speed</p> <p>of</p> <p>the</p> <p>engine</p> <p>shall</p> <p>be</p> <p>not</p> <p>less</p> <p>than</p> <p>2500</p> <p>rpm</p>	<p>Engine</p> <p>speed</p> <p>of</p> <p>the</p> <p>engine</p> <p>shall</p> <p>be</p> <p>not</p> <p>less</p> <p>than</p> <p>25</p> <p>minutes</p>

P	Conditions	Duration of phase (minutes)	
		3	6
1	Idling	6	6
2	25% load at 75% S	40	50
3	50% load at 75% S	40	50
4	100% load at 75% S	30	10
5	50% load at 100% S	12	12
6	25% load at 100% S	22	22
-	Total Time	150	150

3.4.4. During this conditioning procedure, at the request of the manufacturer, the engine and the silencer may be cooled in order that the temperature recorded at a point not more than 100 mm from the exhaust gas outlet does not exceed that measured when the vehicle is running at 110 km/h or 75 per cent of S in top gear. The engine and/or vehicle speeds shall be determined to within ± 3 per cent.

Figure 1

Test apparatus for conditioning by pulsation



1. Inlet flange or sleeve for connection to the rear of the test exhausts system.
2. Hand-operated regulating valve.
3. Compensating reservoir with a maximum capacity of 40 l and a filling time of not less than one second.
4. Pressure switch with an operating range of 0.05 to 2.5 bar.
5. Time delay switch.
6. Pulse counter.
7. Quick-acting valve, such as exhaust brake valve 60 mm in diameter, operated by a pneumatic cylinder with an output of 120 N at 4 bar. The response time, both when opening and closing, shall not exceed 0.5 second.
8. Exhaust gas evacuation.
9. Flexible pipe.
10. Pressure gauge.

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Annex 4

Statement of Compliance with the Additional Sound Emission Provisions

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

..... (Name of manufacturer) attests that the non-original replacement exhaust silencing systems of this type (type with regard to its sound emission pursuant to Regulation No. 9/41/63, whatever is applicable¹) comply with the requirements of paragraph 6.3 of Regulation No. 9/41/63, whatever is applicable¹.

..... (Name of manufacturer) makes this statement in good faith, after having performed an appropriate evaluation of the sound emission performance of the vehicles.

Date:

Name of authorized representative:

Signature of authorized representative:

_____ "

Justification: This annex is needed, if the ASEP requirements in paragraph 6 of this Regulation are accepted.

¹ Delete whatever is not applicable