

31 August 1993

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

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UNIFORM PROVISIONS CONCERNING THE APPROVAL OF REPLACEMENT EXHAUST SILENCING SYSTEMS
(RESS) FOR MOTOR CYCLES



UNITED NATIONS

Regulation No. 92

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF REPLACEMENT EXHAUST SILENCING
SYSTEMS (RESS) FOR MOTOR CYCLES

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Regulation No. 92

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF REPLACEMENT EXHAUST
SILENCING SYSTEMS (RESS) FOR MOTOR CYCLES

1. SCOPE

This Regulation contains provisions relating to the approval of RESS or components thereof to be fitted as replacement parts to one or more specific types of two-wheeled motor cycles other than those having a maximum design speed limited to 50 km/h.

2. DEFINITIONS

For the purpose of this Regulation,

- 2.1. "Exhaust silencing system" means a complete set of components necessary for limiting the noise produced by the engine of a motor cycle and its exhaust;
- 2.2. "Exhaust silencing system component" means one of the various components which together form the exhaust system; 1/
- 2.3. "Exhaust silencing systems of different types" means silencing systems which differ significantly in such respects as:
- 2.3.1. Their components bear different trade names or marks,
- 2.3.2. 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,
- 2.3.3. The operating principles of at least one component are different,
- 2.3.4. Their components are combined differently;
- 2.4. "Replacement exhaust silencing system (RESS) or component thereof" means any part of the exhaust silencing system defined in paragraph 2.1 above 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. 41;
- 2.5. "Approval of a RESS 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 motor cycle, as regards the limitation of their noise level;
- 2.6. "Motor cycle type" means a category of motor cycles which do not differ in such essential respects as:
- 2.6.1. The type of engine (two-stroke or four-stroke, etc.; number and capacity of cylinders; fuel supply system; arrangement of valves; maximum power and corresponding engine speed (rpm), etc.),
- 2.6.2. Number and ratio of gears,
- 2.6.3. Silencing system(s).

3. APPLICATION FOR APPROVAL

- 3.1. The application for approval of a RESS or components thereof shall be submitted by its manufacturer or by his duly accredited representative.
- 3.2. It shall be accompanied by the undermentioned documents in triplicate and the following particulars:
- 3.2.1. A description of the motor cycle type(s) on which the RESS 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;
- 3.2.2. A description of the complete RESS showing the relative position of each of its components, together with instructions for their assembly;
- 3.2.3. Detailed drawings of each RESS component to enable it to be easily located and identified, and specification of the materials used.
- 3.3. At the request of the technical service conducting the tests for approval, the manufacturer of the RESS shall submit:
- 3.3.1. Two samples of the RESS or its components submitted for approval;
- 3.3.2. A sample of the original exhaust silencing system with which the motor cycle was equipped when submitted for type approval;
- 3.3.3. A test motor cycle representative of the type to which the RESS is to be fitted; this motor cycle, when measured for noise emission according to the methods described in paragraphs 3.1. and 3.2. of annex 3 to Regulation No. 41, shall satisfy the following conditions:
- 3.3.3.1. The sound level, during the test in motion, shall not exceed by more than 1 dB(A) the limit value applicable to the category of motor cycle concerned at the time when that type of motor cycle was approved; nor shall it exceed, by more than 3 dB(A), the sound level indicated in the approval form of that motor cycle type,
- 3.3.3.2. The sound level, when the motor cycle is stationary, shall not exceed, by more than 3 dB(A), the reference value indicated in the approval form of that motor cycle type;
- 3.3.4. A separate engine, of the same type as that of the motor cycle for which the RESS is submitted for approval (if the technical service responsible for conducting the tests considers it necessary).
- 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. MARKINGS

- 4.1. Each component of the RESS, excluding pipes and fitting accessories, shall bear:

- 4.1.1. The trade name or mark of the manufacturer of the RESS of its components;
- 4.1.2. The commercial designation given by the manufacturer.
- 4.2. These markings shall be clearly legible and be indelible.
- 4.3. The RESS shall be labelled by its manufacturer, indicating the type(s) of motor cycle(s) for which it has been granted the approval.
5. APPROVAL
- 5.1. If the RESS 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 RESS type approved. Its first two digits (at preset 00 for the Regulation in its original form) 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 RESS or component designed for, the same type(s) of motor cycle.
- 5.3. Notice of approval or extension or refusal of approval of a RESS 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 RESS and component thereof conforming to a type approved under this Regulation an international approval mark consisting of:
 - 5.4.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval; 2/
 - 5.4.2. 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 5.4.1.
 - 5.4.3. 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 RESS 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 RESS; in this case the circle need not be repeated. Annex 2 to this Regulation gives an example of the approval mark.
6. SPECIFICATIONS
- 6.1. General specifications
 - 6.1.1. The silencer must be designed, constructed and capable of being mounted so that:

- 6.1.1.1. The motor cycle 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,
- 6.1.1.2. 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,
- 6.1.1.3. The ground clearance provided by the silencer originally fitted, and the possible inclined position of the motor cycle, are not reduced,
- 6.1.1.4. Unduly high temperatures do not exist at the surface,
- 6.1.1.5. Its edges are not sharp or jagged,
- 6.1.1.6. Adequate clearance of spring parts is provided,
- 6.1.1.7. Adequate safety clearance of pipes is provided,
- 6.1.1.8. It is tamper-resistant in a way that is compatible with clearly-defined maintenance and installation requirements.

6.2. Specifications for sound levels

- 6.2.1. The acoustic efficiency of the RESS or components thereof shall be verified by means of the methods described in paragraphs 3.1 and 3.2 of annex 3 to Regulation No. 41. When the RESS or its components is fitted to the motor cycle described in paragraph 3.3.3. above, the sound level values obtained using the two methods (stationary and running vehicle) shall satisfy one of the following conditions:
 - 6.2.1.1. They shall not exceed the sound level values recorded for the type of motor cycle concerned when it was originally submitted for type approval, or
 - 6.2.1.2. They shall not exceed the sound level values measured on the test motor cycle referred to in paragraph 6.2.1. above when fitted with an original exhaust silencing system of the type fitted to the motor cycle when the latter was submitted for type approval.

6.3. Measurement of vehicle performance

- 6.3.1. The RESS or its components shall be such as to ensure that the motor cycle's performance is comparable with that achieved with the original exhaust silencing system or components thereof.
- 6.3.2. The RESS 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 referred to in paragraph 3.3.3. above.
- 6.3.3. The verification shall be carried out by measuring the output curve in accordance with paragraph 6.3.4.1. or 6.3.4.2. below. The maximum power and the maximum power speed measured with the RESS shall not exceed the maximum power and the maximum speed measured under the conditions set out below with the original equipment exhaust system by more than 5%.

6.3.4. Test method

6.3.4.1. Engine test method

The measurements shall be carried out on the engine referred to in paragraph 3.3.4. above or, if it is not available, on the engine of the motor cycle referred to in paragraph 3.3.3. above, the engine being in both cases mounted on a dynamometer.

6.3.4.2. Motor cycle test method

The measurements shall be carried out on the motor cycle referred to in paragraph 3.3.3. above. The values obtained with the original silencing system shall be compared with those obtained with the RESS. The test shall be conducted on a roller dynamometer.

6.4. Additional provisions regarding the RESS or its components filled with fibrous materials

The use of fibrous absorbent material shall be permitted in the construction of the RESS only if the requirements in annex 3 are met:

7. MODIFICATION OF THE TYPE OF RESS AND EXTENSION OF APPROVAL

7.1. Every modification of the type of RESS or its components shall be notified to the administrative department which approved the type of RESS. The said department may then either:

7.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect, or

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

7.2. The manufacturer of the RESS or component thereof or his duly accredited representative may ask the administrative department which has granted the approval of the RESS for one or several types of motor cycle for an extension of the approval to other types of motor cycle. 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 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

8.1. The RESS 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.

- 8.2. In order to verify that the requirements of paragraph 8.1. are met, suitable controls of the production shall be carried out.
- 8.3. The holder of the approval shall in particular:
- 8.3.1. Ensure existence of procedures for the effective control of the quality of RESS,
- 8.3.2. Have access to the control equipment necessary for checking the conformity of each approved RESS type,
- 8.3.3. Ensure that data of test results are recorded and that the annexed documents remain available for a period to be determined in accordance with the administrative service,
- 8.3.4. Analyse the results of each type of test, in order to verify and ensure the stability of the product characteristics making allowance for variation of an industrial production.
- 8.3.5. Ensure that for each type of RESS at least the tests prescribed in paragraph 6. of this Regulation are carried out,
- 8.3.6. Ensure that any sampling of samples or test pieces giving evidence of non-conformity with the type of test in question shall give rise to a further sampling and test. All the necessary steps shall be taken to re-establish the conformity of the corresponding RESS production.
- 8.4. The competent authority which has granted type-approval may at any time verify the conformity control methods applicable to each production unit.
- 8.4.1. In every inspection, the test books and production survey records shall be presented to the visiting inspector.
- 8.4.2. The inspector may take samples at random which will be tested in the manufacturer's laboratory. The minimum number of samples may be determined according to the results of the manufacturer's own verification.
- 8.4.3. When the quality level appears unsatisfactory or when it seems necessary to verify the validity of the tests carried out in application of paragraph 8.4.2. the inspector shall select samples to be sent to the technical service which has conducted the type approval tests.
- 8.4.4. The competent authority may carry out any test prescribed in this Regulation.
- 8.4.5. The normal frequency of inspections by the competent authority shall be one every two years. If unsatisfactory results are recorded during one of these visits, the competent authority shall ensure that all necessary steps are taken to re-establish the conformity of production as rapidly as possible.
9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION
- 9.1. The approval granted in respect of a type of RESS 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 RESS or its components fail to pass the tests provided for in paragraph 8.3.5. 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 applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

10. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of replacement silencing system or components thereof 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 Contracting Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

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

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 administrative departments which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, or production definitely discontinued issued in other countries, are to be sent.

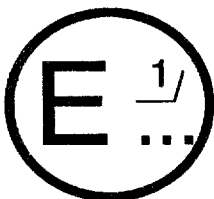
1/ Those components are, in particular, the exhaust manifold, the silencer proper, the expansion chamber and the resonator.

2/ 1 for the Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for the Czech Republic, 9 for Spain, 10 for Yugoslavia, 11 for the United Kingdom, 12 for 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, 25 (vacant) and 26 for Slovenia. 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 Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

Annex 1

COMMUNICATION

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



issued by: Name of administration:

- concerning: 2/ APPROVAL GRANTED
 APPROVAL EXTENDED
 APPROVAL REFUSED
 APPROVAL WITHDRAWN
 PRODUCTION DEFINITELY DISCONTINUED

of a vehicle type with regard to a type of RESS or component thereof pursuant to Regulation No. 92

Approval No. Extension No.

1. Trade name or mark of the RESS
2. Type of the RESS
3. Manufacturer's name and address
4. If applicable, name and address of manufacturer's representative

5. Brief description of the RESS (with/without 2/) fibrous materials, etc.

6. Trade name or mark of the motor cycle type(s) for which the RESS is intended:
7. Motor cycle type(s), starting from serial number:
8. Kind of engine 3/:
9. Cycle: two-stroke or four-stroke
10. Cylinder capacity(ies)
11. Engine power(s)
12. Number of rpm, at maximum engine power(s)
13. Number of gears

14. Gears used
15. Total drive ratio(s), expressed in vehicle speed at 1,000 rpm
.....
16. Maximum authorized total weight
17. Load conditions of motor cycle during test
18. Sound levels:
 - Motor cycle in motion dB(A)
 - Steady speed before acceleration km/h in second gear
 - " " " " km/h in third gear
 - Motor cycle stationary dB(A) with engine
speed of rpm
19. Output curve (annexed)
20. Variations recorded when the soundmeter was calibrated
21. RESS submitted: for approval on
for extension of approval on
22. Technical service responsible for conducting approval tests
.....
23. Date of report issued by that service
24. Number of report issued by that service
25. Approval granted/refused/extended/withdrawn 2/
26. Position of approval mark on the RESS
27. Place
28. Date
29. Signature
30. The following documents, bearing the approval number shown above, are
available upon request:

1/ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation.

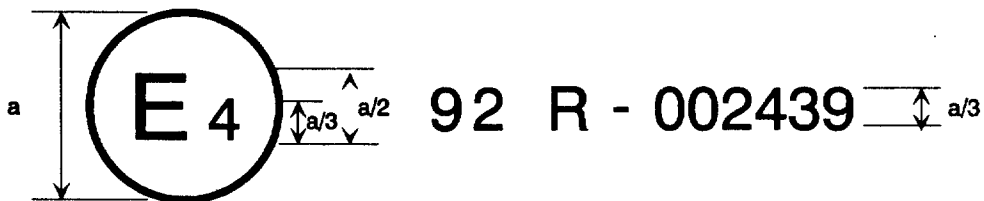
2/ Strike out what does not apply.

3/ In the case of a non-conventional type of engine, please specify.

Annex 2

EXAMPLE OF THE APPROVAL MARK

(see paragraph 5.4. of this Regulation)



a = 8 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. 002439. The first two digits of the approval number 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 RESS

(see paragraph 6.4. of this Regulation)

1. Fibrous absorbent material must 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 must 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 must comply with the following requirements:
 - 3.1. The material must 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.
 - 3.2. After heating at $650 \pm 5^{\circ}\text{C}$ for one hour in a furnace, at least 98% of the material must be retained in a sieve of nominal aperture size $250 \mu\text{m}$ complying with ISO standard 3310/1 when tested in accordance with ISO standard 2599.
 - 3.3. The loss in weight of the material must not exceed 10.5% after soaking for 24 hours at $90 \pm 5^{\circ}\text{C}$ in a synthetic condensate of the following composition:

1 N hydrobromic acid (HBr)	10 ml
1 N sulphuric acid (H_2SO_4)	10 ml
Distilled water to make up to 1,000 ml	
- Note: The material must 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 must be put into a normal state for road use by one of the following conditioning methods in accordance with the manufacturer's choice:
 - 4.1. Conditioning by continuous road operation.
 - 4.1.1. According to the classes of motor cycles, the minimum distances to be completed during conditioning are:

CLASS OF MOTOR CYCLE According to cylinder capacity in cm ³		DISTANCE (km)
1.	≤ 80	4 000
2.	> 80 ≤ 175	6 000
3.	> 175	8 000

4.1.2. 50% ± 10% 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.

4.1.3. The two speed modes must be alternated at least six times.

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

4.2. Conditioning by pulsation

4.2.1. The exhaust system or components thereof must be fitted to the motor cycle or to the engine. In the former case, the motor cycle must be mounted on a roller dynamometer. In the second case, the engine must 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.

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

4.2.3. The valve must 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 must open when the gas back-pressure reaches a level equivalent to 90% of the maximum that can be measured before the engine stops. It must close when this pressure does not differ by more than 10% from its stabilized value with the valve open.

4.2.4. The time-delay switch must be set for the duration of exhaust gases calculated on the basis of the requirements of paragraph 4.2.3 above.

4.2.5. Engine speed must be 75% of the speed (S) at which the engine develops maximum power.

4.2.6. The power indicated by the dynamometer must be 50% of the full-throttle power measured at 75% of engine speed (S).

4.2.7. Any drainage holes must be closed off during the test.

4.2.8. The entire test must be completed within 48 hours. If necessary, a cooling period must be allowed after each hour.

4.3. Conditioning on a test bench

4.3.1. The exhaust system must be fitted to an engine representative of the type fitted to the motor cycle for which the system is designed, and mounted on a test bench.

4.3.2. 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 is:

CLASS OF MOTOR CYCLE According to cylinder capacity in cm ³		NUMBER OF CYCLES
1.	≤ 80	6
2.	> 80 ≤ 175	9
3.	> 175	12

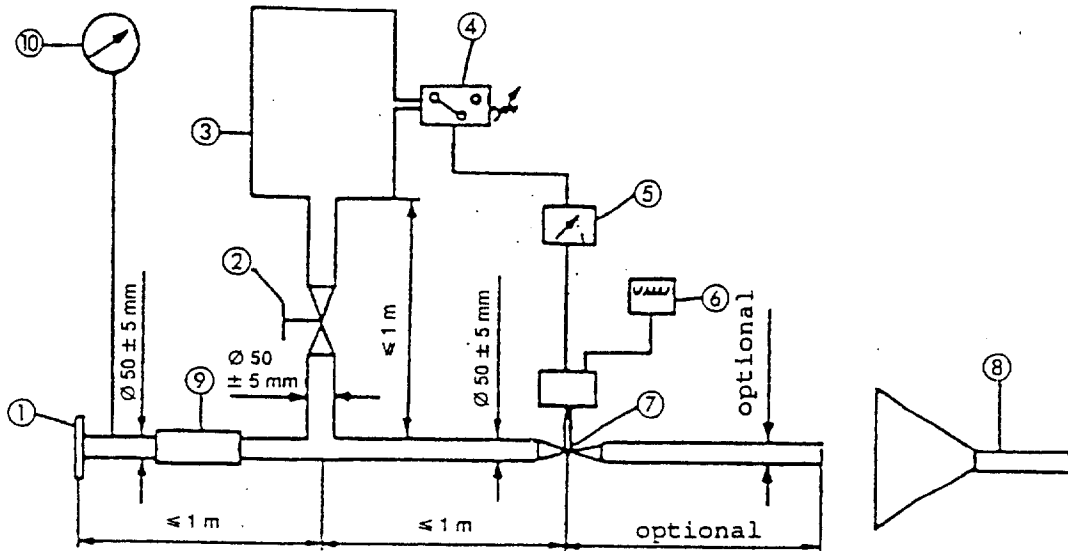
4.3.3. Each test-bench cycle must be followed by a break of at least six hours in order to reproduce the effects of cooling and condensation.

4.3.4. Each test-bench cycle consists of six phases. The engine conditions for and the duration of each phase are:

Phase	Conditions	Duration of phase	
		Engines of less than 175 cm ³	Engines of not less than 175 cm ³
1	Idling	(min.) 6	(min.) 6
2	25% load at 75% of S	40	50
3	50% load at 75% of S	40	50
4	100% load at 75% of S	30	10
5	50% load at 100% of S	12	12
6	25% load at 100% of S	22	22
Total time		2.5h	2.5h

4.3.5. 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 motor cycle is running at 110 km/h or 75% of S in top gear. The engine and/or motor cycle speeds are determined to within ± 3%.

Figure 1
Test apparatus for conditioning by pulsation



1. Inlet flange or sleeve for connection to the rear of the test exhaust 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, must not exceed 0.5 second.
8. Exhaust gas evacuation.
9. Flexible pipe.
10. Pressure gauge.