

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(75) 634 final

Brussels, 12 December 1975

Proposal for a

COUNCIL DIRECTIVE

on the approximation of the laws of
the Member States relating to the
permissible sound level and to the
exhaust system of motor cycles

(submitted to the Council by the Commission)

EXPLANATORY MEMORANDUM1. General

This proposal for a Directive comes within the scope of the Community-level type-approval procedure for motor cycles which was the subject of the proposal for a Directive submitted by the Commission to the Council on 24 July 1974 (1).

This proposal concerns the approximation of the laws of the Member States relating to the permissible sound level and the exhaust systems of motor cycles.

In a letter of 31 January 1974, the French Government notified the Commission, pursuant to the agreement of 28 May 1969 concerning the status quo and keeping the Commission informed, of its intention to amend French legislation in this regard. However, the Government has agreed to postpone putting its draft into force until the Council has adopted a Directive.

Other Member States too have legislation, either at the draft stage or in force, concerning these aspects of motor cycles. Being aware of the differences between the prescribed sound emission levels which are likely to create barriers to trade, the Commission is proposing, pursuant to Article 100 of the Treaty, Community-level provisions aimed at harmonizing the national provisions in force which affect the establishment and the functioning of the common market.

Furthermore, the declaration of the Council of the European Communities and of the representatives of the governments of the Member States meeting in the Council on 22 November 1973 on the subject of the environment programme, provides for a reduction of the sound emissions of motorcycles. Motor cycles represent a by no means negligible proportion of the motor vehicles on the roads in urban centres. Moreover, this type of vehicle is tending to increase in number. Furthermore, in view of their technical characteristics, these vehicles are frequently used at full throttle, i.e., at very high engine speeds. It has been proved that with most motor cycles a 20 % increase in speed causes at least a doubling of the sound intensity emitted.

It follows that motor cycles constitute a very important source of nuisance, if not the most annoying, among the land vehicles, and particularly since the application of Council Directive 70/157/EEC of 6 February 1970 led to an appreciable reduction in the noise pollution caused by four-wheeled motor vehicles.

(1) COM(74)1175 final of 24 July 1974

2

2. Comments on the proposal for a Directive

The scope is limited to two or three-wheeled motor cycles whose maximum design speed is greater than 45 km/h. In the case of a three-wheeled vehicle, moreover, the empty weight shall not exceed 400 kg.

Article 2 integrates into the EEC type-approval procedure the provisions relating to the permissible sound level and to the exhaust system of such motor cycles.

Since certain Member States do not at present have a type-approval procedure of their own, it is necessary to lay down provisions ensuring that vehicles conforming to the requirements of the Directive (Article 3) (1) in these States are allowed to be used.

Where the prototype is modified, the Member State which carried out the type approval must be in a position to assess whether it is appropriate to perform fresh tests (Article 4).

Article 5 lays down the procedure for adapting the provisions of the annexes to technical progress, this procedure being set out in Article 13 of the Council Directive of _____ on the type-approval of motorcycles. (2)

Article 6 provides for two deadlines. Before the first deadline, the Member States must adopt and publish the measures necessary to comply with the Directive. The second deadline determines the date on which all the Member States must simultaneously put the common rules into force (article 6 (1)).

-
- (1) OJ L 73 of 27.3.1972 "Documents concerning the accession to the European Communities of the Kingdom of Denmark, Ireland, the Kingdom of Norway and the United Kingdom of Great Britain and Northern Ireland".
Act concerning the conditions of accession and the adjustments to the treaties - Annex I, title X.
- (2) COM(74)1175 final of 24.7.1974.

Finally, the Commission must be informed within a reasonable time of all draft provisions drawn up by the Member States in the field referred to by the Directive, the purpose of this information being to enable the Commission whatever comments it may have to make on these drafts (Article 6 (2)).

The technical annexes contain the requisite definitions, the procedure for application for EEC type-approval, the limits to be observed as regards the sound level during the testing of motorcycles in motion and the requirements concerning measuring instruments, conditions and methods.

A wide measure of agreement was achieved between the experts from the Member States who assisted the competent departments of the Commission in matters concerning the test requirements when this Directive was being drawn up. These requirements state that each type of motorcycle must be subjected to a test while in motion and a test when stationary to be able to obtain EEC type-approval in respect of its sound level. However, only the results of the test in motion are to be compared with the permissible limits and will be determinating as regards the type-approval or rejection of the vehicle. The results of "stationary" test will only be recorded and should serve as a reference for the competent authorities when inspecting vehicles on the road.

The method for measuring the sound level of motorcycles in motion is based on the principle that, bearing in mind their normal conditions of use in urban traffic, the speed of the engine is the main criterion for the noise provoked. In consequence, this method was specified in such a way as to ensure that motorcycles of every category reached at least three-quarters of their maximum engine speed towards the end of the acceleration period, a condition in which the engine at full load generally develops its maximum sound level. This means that, on the test site specified in the Directive, motorcycles are, without exception, to be tested in the gear ratio immediately above the starting ratio. This condition, however, has proved to be very difficult to apply in the case of certain current types of motorcycle with a cylinder capacity below 350 cm³ and equipped with gear boxes having more than four ratios. To enable the manufacturers of such motorcycles to adapt their products to the provisions of this Directive within an appropriate time-limit, a transitional period of two years is scheduled, during which

the "in motion" test for the motorcycles in question is to be carried out in third gear.

With regard to the limit values for the sound level of the various categories of motorcycle, the Commission's proposal met with the proposal of only some of the national experts; it nonetheless represents a happy **medium between** the extrem positions adopted by certain experts.

3. Consultation with the European Parliament and the Economic and Social Committee

In compliance with the provisions of the second paragraph of Article 100, it is necessary to obtain the opinions of these two bodies.

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof;

Having regard to the proposal from the Commission;

Having regard to the Opinion of the European Parliament;

Having regard to the Opinion of the Economic and Social Committee;

Whereas the technical requirements which motorcycles must satisfy in accordance with national laws relate, inter alia, to the permissible sound level and to the exhaust system;

Whereas these requirements differ from one Member State to another; whereas it is therefore necessary that all the Member States adopt the same requirements, either in addition to or in place of their existing rules, in order to allow the EEC type-approval procedure which was the subject of Council Directive No of on the approximation of the laws of the Member States relating to the type-approval of motorcycles to be applied in respect of each type of vehicle;

Whereas the increased numbers and use of motorcycles aggravates the annoyance caused by noise pollution, and whereas therefore the noise emissions of motorcycles should be limited on the basis of a representative method of testing;

Whereas the approximation of national laws relating to motorcycles entails the reciprocal recognition by Member States of the tests carried out by each of them on the basis of common requirements; whereas in order to work properly such a system, involves the application of these requirements by all Member States with effect from the same date,

HAS ADOPTED THIS DIRECTIVE :

(1) COM(74) 2177 final of 20.XII.1974.

Article 6

1. Member States shall adopt and publish by 1 October 1977 the provisions necessary to comply with this Directive and shall forthwith inform the Commission thereof. They shall implement these provisions with effect from 1 October 1978.

2. After notification of this Directive, Member States shall take steps to inform the Commission, in sufficient time for it to make comments, of any draft laws, regulations or administrative provisions which they intend to adopt in the field covered by this Directive.

Article 7

This Directive is addressed to the Member States.

ANNEX I

DEFINITIONS, APPLICATIONS FOR EEC TYPE-APPROVAL, EEC TYPE-APPROVAL, PER-
MISSIBLE SOUND LEVELS, EXHAUST SYSTEM

1. DEFINITIONS

For the purposes of this Directive :

- 1.1. "Type of motorcycle as regards its sound level and exhaust system" means motorcycles which do not differ in such essential respects as :
 - 1.1.1. type of engine (two- or four-stroke, number and volume of cylinders, number of carburettors, arrangement of valves, maximum power speed, etc.);
 - 1.1.2. transmission system, in particular the number of gear ratios;
 - 1.1.3. number, type and arrangement of exhaust systems;
- 1.2. "Exhaust system" means a complete set of components necessary to limit the noise caused by a motorcycle and by its exhaust;
- 1.3. "Exhaust systems of different types" means systems which do not differ in such essential respects as :
 - 1.3.1. systems whose components bear different factory or trade marks;
 - 1.3.2. systems in which the characteristics of the materials forming any component are different or whose components are of a different shape or size;
 - 1.3.3. systems in which the operating principles of at least one component are different;
 - 1.3.4. systems whose components are in different combinations;

.../...

- 1.4. "Component (*) of an exhaust system" means one of the individual components which together form the exhaust system (exhaust pipes and tubes, the silencer itself, etc.).

2. APPLICATION FOR EEC TYPE-APPROVAL

- 2.1. The application for EEC type-approval of a motorcycle type with regard to its sound level and the exhaust system shall be presented by the manufacturer or his agent.
- 2.2. It shall be accompanied by the undermentioned documents in triplicate and the following information :
- 2.2.1. a detailed description of the type of motorcycle with regard to the criteria mentioned in item 1.1. above. The number and/or symbols that characterize the engine and vehicle type must be shown;
- 2.2.2. a list of the components, duly identified, which form the exhaust system;
- 2.2.3. a sketch of the system as a whole and an indication of its position on the motorcycle;
- 2.2.4. detailed sketches relating to each component so that it may be easily located and identified together with information on the materials of which it is made.
- 2.3. A vehicle which is representative of the motorcycle type to be type-approved must be presented to the technical department responsible for the type-approval tests.
- 2.4. At the request of that department, the manufacturer shall in addition present a specimen of the exhaust system.

3. EEC TYPE-APPROVAL

- 3.1. A form conforming to the model in Annex III shall be attached to the EEC type-approval certificate.

(*) If the engine is equipped with an air filter which is indispensable for the purpose of complying with sound-level limit values, it shall be considered as a component of the exhaust system.

4. PERMISSIBLE SOUND LEVELS

4.1. Limits

The sound level of the motorcycles referred to in Article 1 of this Directive, when measured under the conditions set out in points 4.2. to 4.4. of this Annex, may not exceed the following levels :

Category of Cubic Capacity (cm ³)	Permissible Sound Level dB (A)
≤ 50	80
≤ 125	82
≤ 350	84
≤ 500	85
> 500	86
three-wheeled vehicles	86

4.2. Measuring instruments (noise of motorcycles in motion)

4.2.1. Acoustic measurements

4.2.1.1. The apparatus used for measuring the noise level must be a precision instrument of the type described in Publication 179 "Precision sound-level meters", 2nd edition, of the International Electrotechnical Commission (IEC). Measurements shall be carried out using the "fast" display speed and the "A" weighting curve.

4.2.1.2. At the beginning and end of each series of measurements the sound-level meter shall be calibrated according to the manufacturer's instructions with a suitable acoustic source (e.g. pistophone).

4.2.1.3. Speed measurements

Engine speed, motorcycle speed and acceleration distance shall be determined to within $\pm 3\%$.

4.3. Conditions of measurement (noise of motorcycles in motion)

4.3.1. Condition of motorcycle

4.3.1.1. During the measurements the weight of the motorcycle with driver must comply with point 2.4. of the Model Information Document (Council Directive of (1). Before the measurements are made, the vehicle engine must be brought to normal operating temperature. The automatic actuating mechanism of fans which are switched on and off automatically shall not be interfered with during the noise measurements. For vehicles having more than one driven wheel, only the drive provided for normal road operation shall be used. Where a motorcycle is fitted with a side-car, the side-car shall be removed for the purposes of the test.

4.3.2. Test-site

4.3.2.1. The test-site must consist of a central acceleration section surrounded by a substantially flat test-site. The acceleration section must be flat; its surface must be dry and such that rolling noise remains low.

On the test-site the variations in the free sound field between the sound source at the centre of the acceleration section and the microphone must not exceed \pm dB. This condition is deemed to be met if there are no large objects which reflect sound, such as fences, rocks, bridges or buildings, within 50 m of the centre of the acceleration section. The surface of the track must be made of concrete, asphalt of the hot rolled type or any other acoustically equivalent material within a band 10 m wide on both sides of the centre of the acceleration section and be free of powdery snow, tall grass, loose soil or ashes.

(1) COM(74) 2177.

The microphone shall not be obstructed in any way which could affect the sound field, and no persons should stand between the microphone and the sound source. The observer carrying out the measurement must position himself so that he does not affect the reading of the measuring instrument.

4.3.2.2. Measurements may not be carried out in bad weather. Wind effects must be excluded.

4.3.2.3. In type testing measurements, the A-weighted sound level of noise sources other than the motorcycle to be tested or of wind effects must be at least of 10 dB(A) below the sound level produced by the motorcycle. A suitable wind shield may be fitted to the microphone provided that account is taken of its effect on the sensitivity of the microphone.

4.4. Method of Measurement (noise of motorcycle in motion)

4.4.1. Measurement of noise of motorcycle in motion

4.4.1.1. The microphone shall be located 7.5 m from the line of reference CC' (Fig. 1) of the track, 1.2 m above the level of the track. The motorcycle shall be driven over the acceleration section in such a way that the projection of the longitudinal median plane of the vehicle is as close as possible to line CC'.

4.4.1.2. At least two measurements shall be made on both sides of the vehicle.

4.4.1.3. The maximum sound level indicated in decibels (dB) and evaluated by means of the "A" weighting curve shall be measured as the motorcycle is driven between lines AA' and BB' (Fig. 1). The measurement is invalid if there is found to be an abnormal discrepancy between the peak value and the general sound level.

4.4.2. Operation of the motorcycle

4.4.2.1. The motorcycle shall approach line AA' at a steady speed as specified in 4.4.2.2. to 4.4.2.4. When the front end of the vehicle reaches the line AA', the throttle shall be opened as quickly as possible to the fully opened position. This position shall be maintained until the rear end of the vehicle reaches line BB'; the throttle shall then be released as quickly as possible and allowed to return to the idle position.

4.4.2.2. The motorcycle shall approach line AA', at an initial steady speed :

4.4.2.2.1. of 50 km/h, the speed of rotation of the engine being between 50 and 75 % of the speed at which the engine develops its maximum power, or

4.4.2.2.2. less than 50 km/h, the speed of rotation of the engine being equal to 75 % of the speed at which the engine develops its maximum power, or

4.4.2.2.3. more than 50 km/h, the speed of rotation of the engine being equal to 50 % of the speed at which the engine develops its maximum power.

4.4.2.3. The test shall be carried out in the gear ratio immediately above the starting ratio. However, until 1st October 1980 motorcycles having a cubic capacity of not more than 350 cm³ shall be tested in third gear if their gear-box has more than four ratios.

4.4.2.4. For motorcycles without transmission controls the initial steady speed shall be :

4.4.2.4.1. 50 km/h, the speed of rotation of the engine being between 50 and 75 per cent of the speed at which the engine develops its maximum power, or

4.4.2.4.2. less than 50 km/h, the speed of rotation of the engine being equal to 75 % of the speed at which the engine develops its maximum power.

4.4.3. Results

4.4.3.1. All conditions and influences affecting the measurements shall be indicated in the test record in accordance with the Annex II.

4.4.3.2. Reading from the measuring instrument shall be taken to the nearest half-decibel.

Only those measurements may be used for type approval whose difference in two consecutive tests on the same side of the motorcycle is less than or equal to 2 dB.

4.4.3.3. To take account of inaccuracies in the instruments, the result of each measurement shall be arrived at by deducting 1 dB from the meter reading.

4.4.3.4. The highest value recorded shall constitute the test result. Should that value exceed by not more than 1 dB the permissible sound level for the class of motorcycle tested, two further measurements may be made.

The limits laid down in 4.1. shall be regarded as being complied with if three of the four measurements do not exceed the permissible level.

4.5. Measurement of noise of stationary motorcycle

4.5.1. Sound pressure level in the immediate vicinity of motorcycles.

For motorcycle as defined in Article 1 of the present Directive the sound pressure level shall be measured in the immediate vicinity of the exhaust system outlet (silencer) in accordance with the following provisions, the result of the measurement being entered in the test record as laid down in Annex II.

4.5.2. Sound measuring instrument.

A precision sound-level measuring instrument as defined in 4.2.1.1. and 4.2.1.2. shall be used.

4.5.3. Condition of the motorcycle

During the measurements the weight of the vehicle must comply with point 2.4. of the Information Document (Council Directive of (1)). Before the measurements are taken the vehicle engine shall be brought to the normal operating temperature. In the case of fans which are switched on and off automatically, the automatic actuating mechanism shall not be interfered with during the test.

During the measurements the machine shall be in neutral gear. If it is impossible to disconnect the transmission, the driving wheel of the motorcycle must be allowed to rotate freely, for example by placing the vehicle on its centre stand.

4.5.4. Test track

Any area in which there is no significant acoustic disturbances may be used as a test track. Especially suitable are flat surfaces which are covered with concrete, asphalt or some other hard material and are highly reflective; surfaces consisting of earth which has been tamped down must not be used. The test track shall be in the form of a rectangle the sides of which are at least 3 m from the outer edge of the motorcycle. There may be no significant obstacles, e.g. persons other than the rider and the observer within this rectangle. The motorcycle shall be positioned within the said rectangle so that the microphone used for measurement is at least 1 m from any kerbstones which may be present.

Readings of the measuring instrument due to background noises and wind effects must be at least 10 dB(A) lower than the silencer levels to be measured. A suitable wind shield may be fitted to the microphone, provided that account is taken of its effect on the sensitivity of the microphone.

(1) COM(74)2177 of 20.12.1974

4.5.5. Method of measurement

4.5.5.1. Number of measurements

At least three measurements shall be made at each point. Only those values shall be used which have been obtained in three consecutive measurements and which vary by not more than 2 dB(A).

4.5.5.2. Test result

The highest of the three measurements shall constitute the test result.

4.5.5.3. Position of microphone (Fig. 2)

The microphone shall be located level with the exhaust outlet but shall under no circumstances be less than 0.2 m above the surface of the track. The microphone diaphragm must face towards the exhaust outlet and be located at a distance of 0.5 m from it. The axis of the main sensitive area of the microphone must be parallel to the surface of the track at an angle of $45^\circ \pm 10^\circ$ to the vertical plane of the direction of the exhaust emissions.

In relation to this vertical plane, the microphone shall be positioned on the external side of the vehicle contour at the side which gives a maximum distance between the microphone and the vehicle contour.

If the exhaust system has more than one outlet with a centre-to-centre distance between them of less than 0.3 m, the microphone shall be faced towards the outlet which is nearest the vehicle which is higher above the surface of the track. If the centres of the outlets are more than 0.3 m apart, separate measurements shall be made for each of them, the highest figure recorded being taken as the test value.

4.5.6. Engine operating conditions

The engine speed shall be held constant at one of the following values :

- $\frac{S}{2}$ if S exceeds 5,000 rev/min.
- $\frac{3S}{4}$ if S does not exceed 5,000 rev/min.

when S is the speed of rotation at which the engine develops its maximum power.

When constant engine speed is reached, the throttle shall suddenly be returned to the idle position. The sound level shall be measured throughout the duration of deceleration, the maximum deflection of the needle, rounded off to the nearest decibel, being taken as the test value.

4.5.7. Test record

All details regarding the measurement of the noise emitted by stationary vehicles shall be entered in the test record as laid down in Annex II.

5. EXHAUST SYSTEM (SILENCER)

5.1. If the vehicle is fitted with a device designed to reduce the exhaust noise (silencer), the requirements of item 2 shall apply. If the inlet of the engine is fitted with an air filter which is necessary in order to ensure compliance with the permissible sound level, the filter shall be considered to be part of the silencer, and the requirements of item 2 shall also apply to that filter.

5.2. A drawing of the exhaust system shall be annexed to the vehicle type approval certificate.

5.3. The silencer must be marked with a reference to its make and type which is clearly legible and indelible.

- 5.4. The use of fibrous absorbent material is permitted in the construction of silencers only if the following conditions are fulfilled :
- 5.4.1. The fibrous absorbent material may not be placed in those parts of the silencer through which the gases pass,
- 5.4.2. Suitable devices must ensure that the fibrous absorbent material is kept in place for the whole time that the silencer is being used.
- 5.4.3. The fibrous absorbent material must be resistant to a temperature at least 20 % higher than the operating temperature which may occur in the region of the silencer where these fibrous absorbent materials are situated.

FIG. 1 : MEASURING POSITIONS FOR MOTORCYCLE IN MOTION

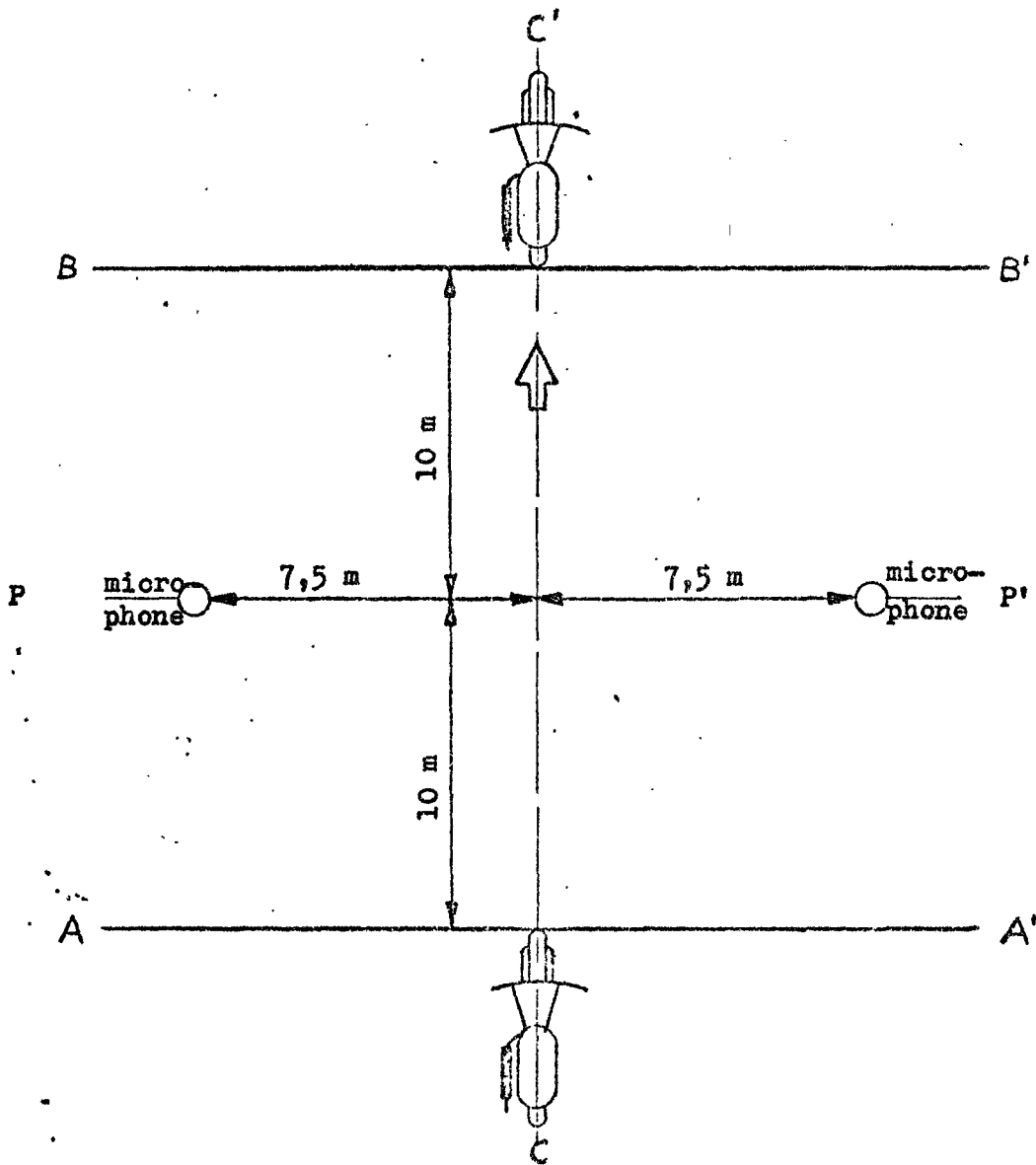
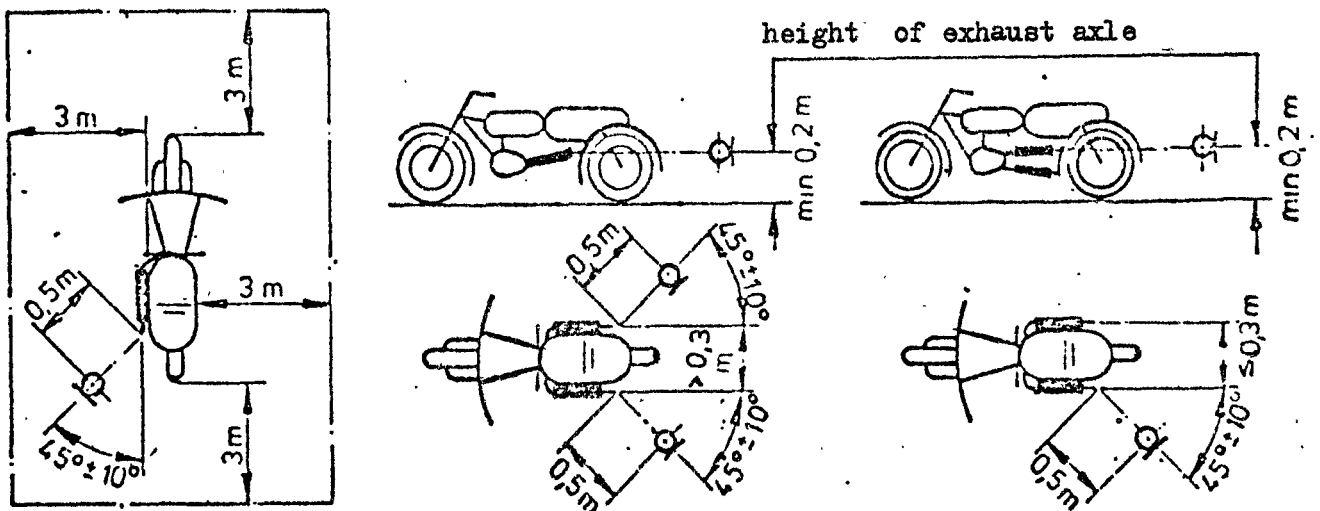


FIG. 2 : MEASURING POSITION FOR STATIONARY MOTORCYCLES



ANNEX III

MODEL

Name of Administration

ANNEX TO THE EEC-TYPE APPROVAL CERTIFICATE WITH REGARD TO
PERMISSIBLE SOUND LEVEL AND THE EXHAUST SYSTEM OF MOTORCYCLES

(Article 4(2) and Article 10 of the Council Directive
of on the approximation of the laws of the Member
States relating to the type approval of motorcycles)

Type-approval No.

1. Trade name or mark of the vehicle

2. Vehicle type

3. Manufacturer's name and address

4. If applicable, name and address of manufacturer's authorised
representative

5. Vehicle submitted for type-approval on

6. Technical service responsible for type-approval tests

7. Date of report issued by that service

8. Number of report issued by that service

9. Type-approval in respect of sound level and exhaust system

10. Place

11. Date

12. Signature

13. The following documents, bearing the type-approval number shown above,
are annexed:

..... system of the exhaust system

..... the test record for measuring sound level