

COUNCIL DIRECTIVE

of 20 June 1972

on the approximation of the laws of the Member States relating to the suppression of radio interference produced by spark-ignition engines fitted to motor vehicles

(72/245/EEC)

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 motor vehicles fitted with a spark-ignition engine must satisfy pursuant to national laws relate, *inter alia*, to the suppression of radio interference produced by such vehicles;

Whereas those requirements differ from one Member State to another; whereas it is therefore necessary that all Member States adopt the same requirements either in addition to or in place of their existing requirements, in order, in particular, to allow the EEC type approval procedure which was the subject of the Council Directive of 6 February 1970¹ on the approximation of the laws of the Member States relating to the type approval of motor vehicles and their trailers to be applied in respect of each type of vehicle;

Whereas it is desirable to follow the technical requirements adopted by the UN Economic Commission for Europe in its Regulation No 10 (Uniform provisions concerning the approval of vehicles with regard to radio interference suppression), which is annexed to the Agreement of

20 March 1958 concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts²;

HAS ADOPTED THIS DIRECTIVE:

Article 1

For the purposes of this Directive, 'vehicle' means any motor vehicle fitted with a high-voltage ignition system, intended for use on the road, with or without bodywork, having at least four wheels and a maximum design speed exceeding 25 km/h, with the exception of vehicles which run on rails, agricultural tractors and machinery, and public works vehicles.

Article 2

No Member State may refuse to grant EEC type approval or national type approval of a vehicle on grounds relating to the radio interference produced by the electric ignition systems of its propulsion engine or engines if such vehicle is fitted with an interference suppressor meeting the requirements set out in the Annexes.

Article 3

The Member State which has granted type approval shall take the necessary measures to be informed of any modification of a part or characteristic referred to in item 2.2 of Annex I. The competent authorities of that State shall determine whether fresh tests should be carried out on the modified prototype and a fresh report drawn up. Where such tests reveal failure to comply with the requirements of this Directive, the modification shall not be approved.

¹ OJ No L 42, 23.2.1970, p. 1.

² Docs E/ECE/324
E/ECE/Trans/505 } Add. 9, 17.12.1968.

Article 4

The amendments necessary for adjusting the requirements of the Annexes so as to take account of technical progress shall be adopted in accordance with the procedure laid down in Article 13 of the Council Directive of 6 February 1970 on the type approval of motor vehicles and their trailers.

Article 5

1. Member States shall put into force the provisions needed in order to comply with this Directive within eighteen months of its notification and shall forthwith inform the Commission thereof.

2. Member States shall ensure that the texts of the main provisions of national law which they adopt in the field covered by this Directive are communicated to the Commission.

Article 6

This Directive is addressed to the Member States.

Done at Luxembourg, 20 June 1972.

For the Council

The President

J. P. BUCHLER

ANNEX I¹

DEFINITIONS, APPLICATION FOR EEC TYPE APPROVAL, MARKINGS, EEC TYPE APPROVAL, SPECIFICATIONS, TESTS, CONFORMITY OF PRODUCTION

(1)

2. DEFINITIONS

For the purposes of this Directive,

(2.1)

2.2 'Vehicle type as regards radio interference suppression' means motor vehicles which do not differ in such essential respects as:

2.2.1 the shapes and constituent materials of the part of the body forming the engine compartment and the part of the passenger compartment nearest to it;

2.2.2 the type of engine (whether two- or four-stroke, number and capacity of cylinders, number of carburettors, arrangement of valves, maximum power and corresponding r.p.m.);

2.2.3 the position or model of the ignition circuit components (coil, distributor, sparking plugs, screening etc.);

2.2.4 the position of metal components housed in the engine compartment (eg heating appliances, spare wheel, air filter etc.);

2.3 'Limitation of radio interference' means a reduction of radio interference in the sound-broadcasting and television frequency bands to a level such that there is no appreciable interference with the functioning of receivers not carried on the vehicle itself; this condition is fulfilled if the level of interference remains below the limits laid down in item 6.2.2 below;

2.4 'Radio interference suppression equipment' means a complete set of components necessary for limiting radio interference from the ignition system of a motor vehicle. Radio interference suppression equipment also includes earthing strips and screening components incorporated specially for radio interference suppression;

¹ The text of the Annexes corresponds to that of Regulation No 10 of the UN Economic Commission for Europe; in particular the breakdown into items is the same; for this reason, where an item of Regulation No 10 has no counterpart in this Directive, its number is given in brackets as a token entry.

2.5 'Suppression equipment of different types' means sets of equipment which differ in such essential respects as:

2.5.1 that their components bear different trade names or marks;

2.5.2 that the 'high-frequency' characteristics of a component are different or their components differ in shape or size;

2.5.3 that the operating principles of at least one component are different;

2.5.4 that their components are assembled differently.

2.6 'Suppression equipment component' means one of the individual constituent parts of the suppression equipment.

3. APPLICATION FOR EEC TYPE APPROVAL

3.1 The application for EEC type approval of a vehicle type with regard to radio interference suppression shall be submitted by the vehicle manufacturer or by his authorized representative.

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

3.2.1 a description of the vehicle type with regard to the items mentioned in item 2.2 above, accompanied by an exploded view or a photograph of the engine compartment. The numbers and/or symbols identifying the engine type and the vehicle type shall be shown;

3.2.2 a list of the components, duly identified' constituting the radio interference suppression equipment;

3.2.3 detailed drawings of each component to enable it to be easily located and identified;

3.2.4 particulars of the nominal value of the direct-current resistances, and, in the case of resistive ignition cables, of their nominal resistance per metre.

3.3 In addition, the application for EEC type approval shall be accompanied by a sample of the radio interference suppression equipment.

3.4 A vehicle representative of the vehicle type to be approved shall be submitted to the technical service responsible for the type approval tests.

4. MARKINGS

4.1 The radio interference suppression equipment components shall bear:

4.1.1 the trade name or mark of the manufacturers of the equipment and its components;

4.1.2 the trade description given by the manufacturer.

4.2 The markings shall be repeated on the radio interference suppression cables at intervals of not more than twelve centimetres.

4.3 These markings shall be clearly legible and indelible.

5. TYPE APPROVAL

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5.2)

5.3 A form conforming to the model in Annex IV shall be attached to the EEC type approval certificate.

(5.4)

(5.5)

(5.6)

6. SPECIFICATIONS

6.1 General specifications

The components of the radio interference suppression equipment shall be so designed, constructed and fitted so as to enable the vehicle, in normal conditions of use, to comply with the requirements of this Directive.

6.2 Specifications concerning radio interference

6.2.1 Method of measurement

The interfering radiation set up by the vehicle type submitted for approval shall be measured by the method described in Annex II.

6.2.2 Reference limits

6.2.2.1 The radiation limits based on quasi-peak measurements shall be 50 $\mu\text{V/m}$ in the 40-75 MHz frequency band and 50-120 $\mu\text{V/m}$ in the 75-250 MHz frequency band, this limit increasing linearly with frequencies above 75 MHz

6.2.2.2 If measurements are made with peak measuring equipment, the readings, expressed in $\mu\text{V/m}$, shall be divided by 10.

6.2.3 On the vehicle type submitted for approval in respect of radio interference suppression, the measured values shall be not less than 20 per cent below the reference limits.

7. TESTS

Compliance with the requirements of item 6 above shall be checked in accordance with the method shown in Annex II.

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9. CONFORMITY OF PRODUCTION

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9.2 When the conformity of a vehicle taken from the series is being verified, production shall be deemed to conform to the requirements of this Directive if the levels measured do not exceed by more than 25% the limits prescribed in item 6.2.2.

9.3 If at least one of the levels measured on the vehicle taken from the series exceeds the limits prescribed in item 6.2.2 by more than 25%, the manufacturer may request that measurements be made on a sample of at least six vehicles taken from the series. The results for each frequency band shall be interpreted by the statistical method shown in Annex III.

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ANNEX II

METHOD OF MEASUREMENT OF RADIO INTERFERENCE PRODUCED BY
HIGH-VOLTAGE IGNITION SYSTEMS

1. MEASURING APPARATUS

The measuring equipment shall comply with the requirements of Publication No 2 (first edition, 1961) of the International Special Committee on Radio Interference (CISPR) or with the specifications applicable to peak type measuring apparatus given in CISPR Publication No 5 (first edition, 1967).

Note: Where the available equipment does not fully meet all the CISPR specifications, discrepancies must be clearly stated.

2. EXPRESSION OF RESULTS

The results of measurements must be expressed in $\mu\text{V/m}$ for 120 kHz bandwidth. For statistical purposes, the logarithmic unit dB ($\mu\text{V/m}$) shall be used. If for certain frequencies the actual bandwidth B (expressed in kHz) of the measuring apparatus differs slightly from 120 kHz, the readings taken should be converted to 120 kHz bandwidth through multiplication by a factor $\frac{120}{B}$.

3. MEASURING SITE

The measuring site shall be a level area free from appreciable wave-reflecting surfaces within an ellipse having a major axis of 20 m and a minor axis of 17.3 m. The antenna and the centre of the engine must be located on the major axis of the ellipse, the plane of symmetry of the vehicle being parallel to the minor axis. The antenna and the point of intersection of the side of the engine nearest to the antenna with the major axis must each be located at a focal point of the ellipse. The measuring set, or the test hut or vehicle in which the set is located, may be within the ellipse but horizontally not closer than 3 m to the antenna, in a direction opposite to the vehicle being measured. Furthermore, the absence of any extraneous noise or signal which could materially affect the measurement must be ensured; a check is therefore made, with the engine stopped, before and after taking the measurements, which can be considered satisfactory only if the readings are at least 10 dB above the highest obtained at the pre- and post-measurement checks.

4. VEHICLE

4.1 Only the ancillary electrical equipment necessary for the running of the engine shall be operating.

4.2 The engine shall be at its normal operating temperature. During each measurement, the engine shall be operated as follows:

Number of cylinders	Method of measurement	
	Peak	Quasi-peak
One	Above idling	2500 r.p.m.
More than one	Above idling	1500 r.p.m.

4.3 Measurements shall not be made while rain is falling on the vehicle or within 10 minutes after rain has stopped.

5. ANTENNA

5.1 Height

The centre of the dipole shall be 3 m above the ground.

5.2 Distance of measurement

The horizontal distance from the antenna to the nearest metal part of the vehicle shall be 10 m.

5.3 Antenna location relative to vehicle

The antenna shall be placed successively on the left- and right-hand sides of the vehicle, at two positions of measurement, with the aerial parallel to the plane of symmetry of the vehicle and in line with the engine. (See Appendix to this Annex.)

5.4 Antenna position

At each of the measuring points, readings shall be taken with the dipole in a horizontal and in a vertical position. (See Appendix to this Annex.)

5.5 Readings

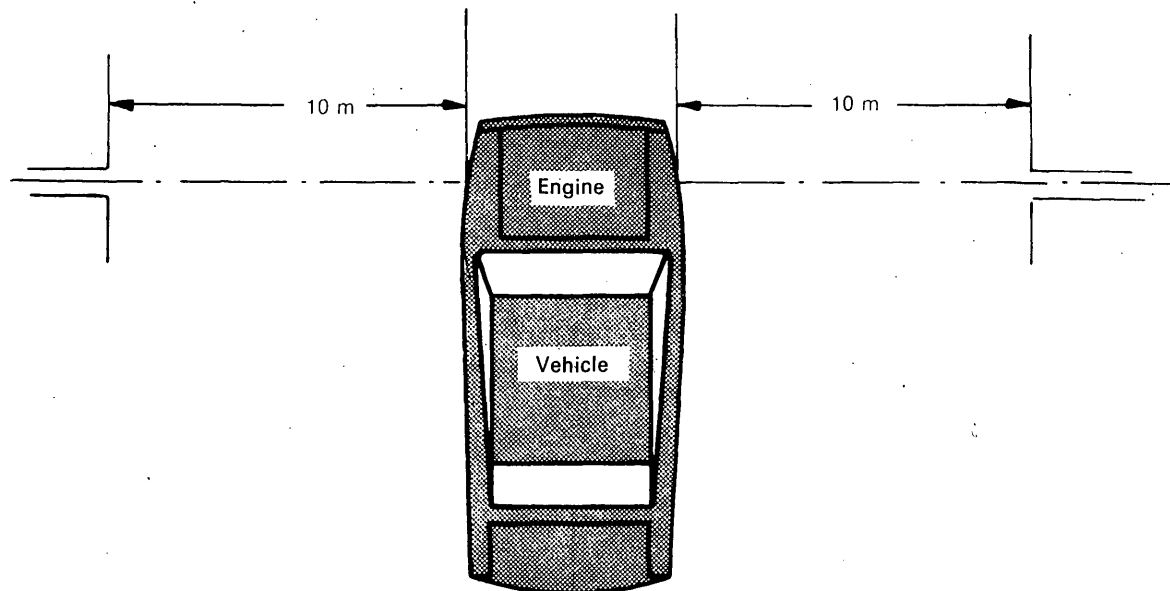
The maximum of four readings shall be taken as the characteristic reading at the frequency at which the measurements were made.

6. FREQUENCIES

Measurements shall be made within the 40 to 250 MHz range. A vehicle is considered as very likely to meet the required suppression limits over the whole frequency range if it meets them at the following six frequencies: 45, 65, 90, 150, 180 and 220 (± 5 MHz). (The 5 MHz tolerance for the six frequencies chosen should make it possible to avoid interference from transmissions operating on the nominal frequencies.)

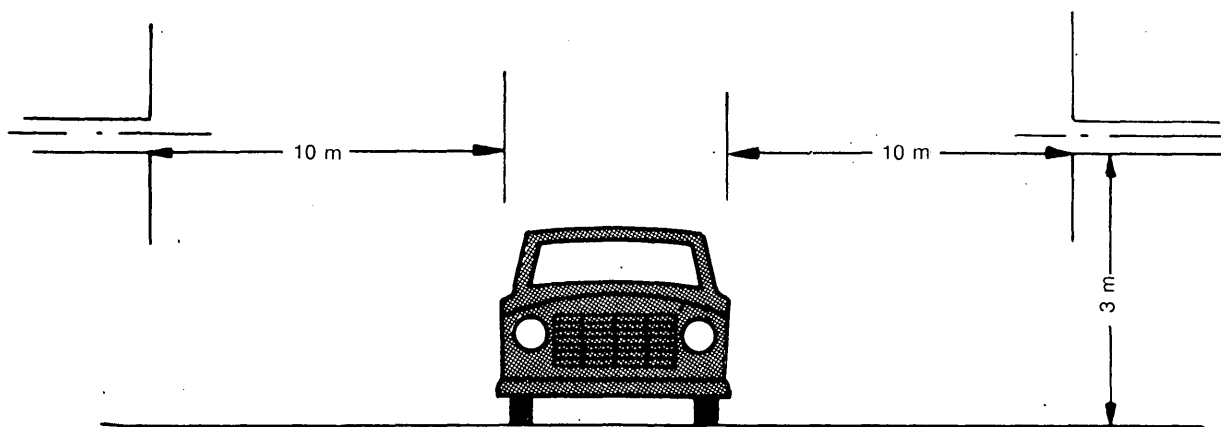
Appendix

ANTENNA DIRECTION RELATIVE TO VEHICLE



Plan

Dipole antenna in position to measure horizontal component of the radiation



Elevation

Dipole antenna in position to measure vertical component of the radiation

ANNEX III

STATISTICAL METHOD OF CHECKING RADIO INTERFERENCE SUPPRESSION

In order to ensure with an 80% probability that 80% of the vehicles conform to a specified limit L , the following condition must be satisfied:

$$x + kS_n \leq L$$

where \bar{x} = arithmetic mean of the results on n vehicles

k = statistical factor which depends on n as shown in the following table:

$n = 6$	7	8	9	10	11	12
$k = 1.42$	1.35	1.30	1.27	1.24	1.21	1.20

S_n = standard deviation of results on n vehicles

$$S_n^2 = \sum (x - \bar{x})^2 / (n - 1)$$

x = individual result

L = specified limit

S_n , x , \bar{x} and L expressed in dB ($\mu\text{V/m}$).

If a first sample of n vehicles does not meet the specification, a second sample of n vehicles shall be tested and the overall results assessed as coming from a sample of $2n$ vehicles.

ANNEX IV

Name of administration

MODEL

COMMUNICATION CONCERNING THE APPROVAL OF A VEHICLE TYPE WITH REGARD TO RADIO INTERFERENCE SUPPRESSION

- Type Approval No
1. Mark (Trade name)
 2. Vehicle type and commercial description
 3. Name and address of manufacturer
 4. If applicable, name and address of manufacturer's authorized representative
 5. Brief description of the radio interference suppression equipment and of the vehicle fitted with such equipment
 6. Vehicle submitted for type approval on
 7. Technical service responsible for type approval tests
 8. Date of report issued by that service
 9. Number of report issued by that service
 10. Type approval as regards radio interference suppression has been granted/refused¹
 11. Place
 12. Date
 13. Signature
 14. The following documents, bearing the type approval number shown above, are annexed to this communication:
 - drawings, diagrams and plans of the engine and of the engine compartment;
 - photographs of the engine and of the engine compartment;
 - list of components, duly identified, constituting the radio interference suppression equipment.

¹ Delete whichever is inapplicable.