COMMISSION OF THE EUROPEAN COMMUNITIES

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Brussels, 4 July 1991

Proposal for a

COUNCIL DIRECTIVE

AMENDING DIRECTIVE 77/143 EEC ON THE
APPROXIMATION OF THE LAWS OF THE
MEMBER STATES RELATING TO ROADWORTHINESS TESTS
FOR MOTOR VEHICLES AND THEIR TRAILERS

(EXHAUST EMISSIONS)

(presented by the Commission)

Explanatory Memorandum

General Comments

Actual Situation

Directive 77/143/EEC[1], as amended by Directive 88/449/EEC[2], concerns the technical inspection of heavy goods vehicles, buses, taxis, ambulances and light goods vehicles.

These Directives set the periodicity of tests and provide a list of the items to be tested.

Given that Directive 77/143/EEC does not set standard criteria for any of the items that should be tested, it is thus necessary to set common minimum test standards in order to guarantee an equal level of safety and through this proposal, environmental performance throughout the Community.

Directive 91/225/EEC[3] amending Directive 77/143/EEC, which was recently adopted by the Council, is aimed at the establishment of a procedure for the announcement of separate Directives for testing the standard of the items listed in Annex II of Directive 77/143/EEC. It also establishes a Technical Committee which gives the Commission the mandate to adopt measures in order to adjust the technical requirements to progress.

In line with the above, this new proposal amends Annex II to Directive 77/143/EEC as amended by 88/449/EEC so as to better define the limit values for the acceptable levels of gaseous emissions for spark ignition (petrol) and smoke opacity for compression ignition (diesel) engined motor vehicles.

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(1) OJ No. L47, 18.02.1977, p. 47

(2) OJ No. L222, 12.08.1988, p. 10

(3) OJ No. L103, 23.04.1991, p. 3

Scope of the proposal

The scope of Directive 77/143/EEC as amended by 88/449/EEC includes heavy and light commercial vehicles (as well as taxis and ambulances) but does not include passenger cars. Passenger cars are the subject of an amending proposal COM(86)214[4]. Adoption of COM(86)214 will ensure that all motor vehicles, both passenger and commercial, are subject to the necessary emission checks.

This proposal on testing the level of vehicle gaseous emissions or smoke opacity dovetails into the current and proposed roadworthiness schemes and so shares the same periodicity of testing. By the time this proposal is adopted, or soon after, the legislation affecting the manufacture of petrol engined passenger cars will be such as to force the use of closed loop 3way catalytic converter systems which are lambda probe controlled for most, if not all, new vehicles. The type approval durability requirements for these vehicle emission control systems would support a three year in use start point before they need to be roadworthiness tested.

Heavy commercial vehicles (and also taxis and ambulances) will need to be tested every year from the time of their first use, the diesel engined vehicles requiring to demonstrate their level of engine maintenance through a smoke opacity check. Light commercial vehicles (less than 3.5 tonnes) will require a test periodicity of at least commencing four years from first use and thereafter every two years. It is considered that the durability of diesel engined vehicles justifies this periodicity.

Vehicles first used before 1st January 1970 will not be required to undergo an exhaust emission or smoke opacity check. However, Member States will be free to test these vehicles to their own national standards if they so wish.

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(4) OJ No. C 133, 31.05.1986, P. 3

Limit values

After much discussion with Member States National experts on roadworthiness testing, on vehicle construction standards and with representatives from the automobile and vehicle inspection industries it has been decided to set maximum vehicle gaseous emission and smoke opacity limit values which will ensure that the "gross polluters" will fail the test. The limits for Carbon Monoxide emissions for conventional petrol engined vehicles, at 4.5 vol % and then 3.5 vol %, reflect studies (in the UK) that have shown that some 50 % of CO emissions comes from the worst 17 % or so of the petrol engined vehicles on the roads at the moment. Whereas those studies have also shown that around 25 % of current in service conventionally engined passenger cars have CO emission values worse than 4.5 vol %, bearing in mind that testing commences after the vehicles are 3 years old, it is anticipated that an initial failure rate of up to 50 % could be expected. Clearly it is in the publics interest to ensure that their vehicles are correctly adjusted and maintained.
[As an alternative to the 4.5/3.5 vol % CO limits, the maximum content of CO in the exhaust gas at idling shall be that stated by the vehicle manufacturer and recorded at type approval testing. This alternative is always equal to or lower than the 4.5/3.5 vol % limit.]

For petrol engined vehicles with advanced emission control systems, ie. with closed loop 3-way catalytic converter which are lambda (air/fuel ratio) probe controlled, the limit CO valve of 0.3 vol % reflects the need to maintain the quantum leap in vehicle emission reduction brought about by the introduction of this new technology.

For vehicles with diesel engines this proposal adopts the philosophy of judging the maintenance condition of the vehicle, and hence its ability to be a low polluter, by measuring the opacity of its exhaust smoke.

The limit values of the coefficient of absorption of the generated smoke of 2.5 m^{-1} for naturaly aspirated diesel engines and 3.0 m^{-1} for turbo charged diesel engines take account of the imprecision of the free acceleration test as a predictor of in service conditions, in particular for turbo charged heavy commercial vehicles, but are sufficiently tight to again identify the gross polluters, vehicles that are responsible for most of the pollution emitted by vehicles in service.

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The Council of the European Communities,

Having regard to the Treaty establishing the European Economic Community and in particular Article 75 thereof,

Having regard to the proposal from the Commission(1),

Having regard to the opinion of the European Parliament(2),

Having regard to the opinion of the Economic and Social Committee(3),

Whereas, Council Directive 77/143/EEC(4) as amended by Directive 88/449/EEC(5) provides for the regular roadworthiness testing of certain road vehicles only (buses, heavy and light goods vehicles, heavy trailers and semi trailers, taxis and ambulances) but not yet for passenger cars;

Whereas, through Council Directive 91/225/EEC(6), it is the intention to establish procedures for the announcement of separate Directives for testing the standard of the items listed in Annex II of the above Directives;

Whereas, through the above directive it is also the intention to establish a Technical Committee which gives the Commission the mandate to adopt measures in order to adjust the technical requirements to progress;

(1) OJ N° C ...
(2) OJ N° C ...
(3) OJ N° C ...
(4) OJ N° L47, 18.2.1977, p. 47
(5) OJ N° L222, 12.8.1988, p. 10
(6) OJ N° L 103, 23.4.1991, p. 3

Whereas, by this Directive it is the intention to maintain the exhaust emission of vehicles at a low level during their useful life by means of a periodical exhaust emission test and ensure that vehicles which are gross polluters are removed from service until they are correctly maintained ;

Whereas, most Member States have adopted procedures for testing heavy commercial vehicles with regard to the opacity of their exhaust smoke;

Whereas, several Member States have national rules for testing the gaseous emissions from lighter vehicles including passenger cars;

Whereas, assessment of the type approval testing for gaseous emissions and diesel smoke for all vehicle types shows that the reproduction of those testing procedures within the roadworthiness test is not realistic;

Whereas, standards that are dictated for in service testing should focus on the maintenance condition of the vehicle, and thereby its ability to meet type approval performance criteria, during a relatively simple, quick and inexpensive test;

Whereas, wrong tuning of the engine and insufficient maintenance are detrimental to the engine and to the environment through increases in pollution and fuel consumption;

Whereas, as far as diesel engines (compression ignition) are concerned, measurement of the opacity of the exhaust emissions is considered a sufficient indicator of the condition of the vehicles' emission control system;

Whereas, for conventional petrol engines (spark ignition) the measurement of the vehicles' tailpipe emissions of carbon monoxide taken at engine idle speed, is considered to give a sufficient indication of the vehicles maintenance condition;

Whereas, it is expected that the failure rate of the above vehicles relating to exhaust emissions could be high if the vehicle has not been subjected to routine maintenance;

Whereas, for petrol engined vehicles where the type approval requirements necessitate that they be equipped with advanced emission control systems such as closed loop, 3way catalytic converters which are lambda probe controlled, the standard for in service emission testing will be more severe than for conventional vehicles;

Whereas, it is the intention to adapt this Directive to take account of future developments on the provision of vehicle construction measures which facilitate in service inspection and advances in testing methodology designed to better reflect conditions in service.

Has adopted this Directive.

Article 1

1. Sub Paragraph 8.2 of Annex II to Directive 77/143 EEC as amended by Directive 88/449 EEC which concerns exhaust emissions is replaced by:

8.2 Exhaust Emissions

8.2.1 Motor vehicles equipped with spark ignition (petrol) engines

a) where the exhaust emissions are not governed by an advanced emission control system such as a closed loop three way catalytic converter which is lambda probe controlled.

1. Visual inspection of the exhaust system in order to check that there are no leakages.

2. Visual inspection of the emission control system if applicable in order to check that the necessary equipment is present.

After a reasonable period of engine conditioning commensurate with the vehicle manufacturers recommendations the carbon monoxide (CO) content of the exhaust gases will be measured at engine idle speed (no load).

The maximum allowable content of CO in the exhaust gases shall be that which is stated by the vehicle manufacturer and recorded at the time of initial type approval with a tolerance of 0.5 vol %. Where this data is not available or where Member States testing authorities decide not to use this data as a reference value then the exhaust gas content of CO must not be greater than the following :

For vehicles manufactured prior to October 1986 or the date on which Member States required the vehicles at first registration to comply with the type approval Directive 70/220/EEC(7) as amended : CO - 4.5 vol %

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(7) OJ Nr L 76 of 9.3.1970, p.

For vehicles manufactured after 1 October 1986 :

CO - 3.5 vol %

Vehicles manufactured prior to 1 January 1970 are exempted from these requirements.

b) where the exhaust emissions are governed by an advanced emission control system such as a closed loop three way catalytic converter which is lambda probe controlled or where the vehicles' exhaust emissions are governed by some other method in order to comply with the type approval provisions of Directive 70/220/EEC as amended [by the consolidated emissions Directive(8)].

1. Visual inspection of the exhaust system in order to check that there are no leakages and that all parts are complete.

2. Visual inspection of the emission control system in order to verify that the necessary equipment is present.

3. Determination of the efficiency of the vehicles emission control system by measuring the lambda value and the CO content of the exhaust gases according to point 4 below or according to the manufacturers optional procedures as recorded at the time of initial type approval. The vehicle shall undergo a period of engine conditioning commensurate with the vehicle manufacturers recommendations for each of the tests.

4. Tail pipe emissions - limit values

- Measurement at engine idle speed ;
  The maximum allowable content in the exhaust gases of CO shall be that which is stated by the vehicle manufacturer and recorded at the time of initial type approval.
  Where this data is not available then the CO limit of 0.5 vol % should not be exceeded.

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(8) Council N° 4102/91 adopted by the Council on 4 March 1991.

- Measurement at increased idling speed without engine load, engine speed to be at least 2000 r.p.m.

  CO content : no greater than 0.3 vol %
  Lambda : 1 ± 0.03 or in accordance with the manufacturers specifications.

8.2.2 Motor vehicles equipped with compression ignition (diesel) engines

Measurement of exhaust gas opacity upon revving the engine with transmission in neutral (no load), i.e. the engine is accelerated from idling speed up to cut off speed. The level of opacity shall be no more than that which is stated by the vehicle manufacturer and recorded on the vehicle at the time of initial type approval with a tolerance of $0.5\ m^{-1}$. Where this data is not available or where Member States testing authorities decide not to use this value as a reference than the following limit values should not be exceeded :

Maximum coefficient of absorption for

Naturally aspirated diesel engines = $2.5\ m^{-1}$.
Turbo charged diesel engines = $3.0\ m^{-1}$.

Vehicles manufactured prior to 1 January 1970 are exempted from these requirements.

8.2.3. Test equipment

The testing of both petrol engined and diesel engined vehicles will require the use of equipment capable of accurately testing vehicles against the prescribed or stated limit values.

Article 2

1. Member States shall take the measures necessary to comply with this Directive before 1 January 1993. They shall forthwith inform the Commission thereof.

2. When the Member States adopt the provisions referred to in paragraph 1, these shall contain a reference to this Directive or shall be accompanied by such a reference at the time of their official publication. The form of this reference shall be decided by the Member States.

3. Member States shall communicate to the Commission the provisions of national law which they adopt in the field governed by this Directive.

Article 3

This Directive is addressed to the Member States.

Done at Brussels, For the Council

The President

Competitiveness and Employment Impact Statement

I. What is the main reason for introducing this measure?

Whereas the build standard of vehicles, with regard to the emissions of gaseous pollutants, have improved over the years, the ability to maintain a reasonably low level of emissions from in service vehicles is tested only in a few Member States. It is recognised as being of vital importance that vehicles continue to produce levels of emissions in service which can equate to their original type approved standard. Tests have shown that vehicles with conventional petrol engines can produce four times or more carbon monoxide than they do when new (although the level of nitrous oxides tends to fall slightly in service). A simple adjustment is invariably all that is required to bring these vehicles back into tune. Modern petrol engined vehicles with catalytic converters (with lambda probe controlled air/fuel ratio) produce in the order of 1/10 the pollutants of conventional vehicles. It is important that this impressive standard is maintained in service as failure of the catalyst through lead poisoning, burn out etc can render the vehicle worse than those with relatively modern conventional engines. For diesel engines, dense clouds of smoke are the obvious manifestation of poor engine maintenance. This poor maintenance will invariably cause high levels of gaseous emissions (as well as soot and other particulates). Again this proposal aims at identifying the gross polluters.

II. Features of the business in question

All users of vehicles, the subject of Directive 77/143/EEC as amended, also garages, technical services and agencies charged with vehicle roadworthiness testing will be affected. As things stand at the moment, only commercial vehicles, including taxis and ambulances, are covered by roadworthiness Directives.

The amendment to include passenger cars within a Community roadworthiness scheme remains on the table of the Council. Until this amendment is adopted this proposal on exhaust emissions will not affect owners of passenger cars nor those small businesses responsible for their operation or maintenance.

III. What obligations does this measure impose directly on business?

Users of vehicles, be they the general public or commercial operators will need to pay particular attention to the standard of maintenance of their vehicles' emission control/engine management systems. This is no more than should reasonably be done anyway for both environmental and fuel saving reasons. The cost of the roadworthiness test may rise (by approximately 20 %) for those Member States that do not currently test for vehicle emissions. Also, the testing agencies/garages will need to invest in equipment which, for testing vehicles with catalysts etc. could cost a further 7000 ECU. However, as yet passenger cars will be unaffected by this proposal until they are included within the roadworthiness scheme.

IV. What indirect obligations are national, regional or local authorities likely to impose on business?

Implementation of the obligations as described in III.

V. Are there any special provisions in respect to SME's?

Where roadworthiness testing is delegated to private garages, these garages will incur an extra cost for test equipment. However, that cost can be offset by increased fees.

VI. What is the likely effect on:

a) The competitiveness of business

The extra complexity of testing for exhaust emissions will increase the cost of the roadworthiness test for commercial vehicle operators by approximately 20 %. This will apply to passenger car operators as and when these vehicles are included in the roadworthiness scheme. This proposal will equalise the conditions of competition by standardising on the type of test to be applied.

Certain EFTA countries (Sweden, Norway, Switzerland and Austria) carry out or are intending to carry out emission testing on the lines of the proposal.

b) Employment

Possibly a marginal increase commensurate with the increased time to test the vehicles.

VII. Have the relevant representation organisations been consulted?

All Member States roadworthiness testing authorities, the coordinating body of roadworthiness testes (CITA), DEKRA, the garage equipment association and private testing organisations have been consulted.

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