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COM (73)2050

Vol. 1973/0368

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COMMISSION OF THE EUROPEAN COMMUNITIES

COM(73) 2050 final

Brussels, 5 December 1973

PROPOSAL FOR A COUNCIL DIRECTIVE

concerning the approximation of the laws of the Member States

relating to the composition of petrol.

- Problem of the lead content of petrol -

(submitted to the Council by the Commission)

1. Introduction

The differences between the laws, regulations or administrative measures in the EEC Member States on the limitation of the lead content of petrol for motor vehicles threatens to create obstacles to the free movement both of fuels and motor vehicles within the Community. The following table summarizes the regulations already in force or in the course of preparation in certain countries.

Country	Lead Content (g/l)		Date into force	R e m a r k s
	present	future		
Belgium	0.84	-	already applies	recommended limit
France	0.64	-	already applies	limit laid down by regulat.
		0.55	1.1.1974	proposed regulation
		0.45	1.1.1976	proposed regulation
Italy	0.64	-	already applies	limit laid down by regulat.
	0.4	-	" "	content which can be relaxed or which can be relieved
Netherlands	0.84	-	already applies	recommended limit
West Germany	0.40	-	already applies	limit laid down by regulat.
		0.15	1.1.1976	" " " " "
United Kingdom	0.84	-	already applies	recommended limit
		0.64	1.1.1973	proposed recommendations
		0.55	1.1.1974	proposed recommendations
		0.45	1.1.1976	proposed recommendations
Switzerland	0.57) prom.		already applies	limit laid down by regulation
	0.54) regul.			
U.S.A.	1.12	-	already applies	Recommended limit
		0.53(*)	1.1.1975	proposed recommendation limits
		0.45(*)	1.1.1976	" " "
		0.40(*)	1.1.1977	" " "
		0.33(*)	1.1.1978	" " "

These differing regulations not only cause the user trouble when travelling in the Member States, but also increase his expenses, since the oil and motor industries are obliged specially to produce and export products which comply with the different regulations of individual countries. This problem is particularly acute in the motor industries, where profitability depends on large production runs.

(*) Maximum permissible value for the arithmetic mean of the lead contents at refinery over a three monthly period.

It would be regrettable if the new market of 260 million consumers created by the accession of Great Britain, Ireland and Denmark were once again to be partitioned, this time because of the technical regulations in force in this field.

2. Actions undertaken by the Commission up to the present time

As soon as the Commission was informed, at the beginning of 1971, of the steps taken or planned by certain Member States to reduce the lead content of petrol, it set up a working party to study the problems posed by air pollution caused by motor vehicles. This working party came together in March 1971. It quickly became apparent that it would be necessary to study the technical and health aspects of the problem separately.

The meetings of the Technical Aspects Study Group have been principally devoted to a study of the implications for automobile construction of the requirement to use fuels which, as a result of a reduced lead content, would have different properties from the fuels now in use. In the course of this work the motor manufacturers concerned have been consulted, particularly about the progress of research on devices for retaining the lead particles in the exhaust systems; these are known as lead traps.

The meetings of the Health Aspects Committee have been principally devoted to studying the effects of lead on the human body and to harmonization of the methods used for determining lead in the atmosphere and in the human body. This committee organized a seminar on lead metabolism, with the aim of pinpointing those factors which are necessary for an evaluation of the relative importance of the various lead sources in the total amount of lead found in the human body. An international symposium was also held in October 1972 on the initiative of the Committee. The aim of this symposium was to assess the state of all the research being carried out into the effects on man of the lead present in the environment.

In addition, the Commission organized two meetings to examine with representatives of the oil and motor industries the technical and economic repercussions of a reduction in the lead content of the petrol on the market.

The work of these working parties was aided by studies prepared for the Commission under contract by competent bodies and experts.

3. Effects of lead on the performance of engines

The engines of European vehicles nowadays have a high output and specific power made possible by high compression ratios and high engine speeds. As a result they require fuels of impressingly high quality. In the present state of the oil industry, it has been possible to improve this quality only by the addition of antiknock agents to the fuels intended for spark-ignition engines.

At present, the quality of such fuels, in terms of the research octane number (RON) is between 98 and 100 for premium and between 90 and 92 for regular. It is estimated that without additives, the RON for clear petrol would be 90/91 for premium and 85 for regular.

The additives most frequently used to increase the antiknock qualities of petrol are lead tetraethyl and lead tetramethyl, as they have hitherto been considered the cheapest and most technically satisfactory.

In most engines the use of petrol with insufficient antiknock causes spontaneous combustion. Pressure variation in the cylinder causes the abnormal running noise called "pinking". When this noise is produced, the engine is being overtreated and overloaded, and prolonged operation under these conditions produces premature wear.

The only way to adapt the engines of vehicles now on the roads to burn a petrol of a quality lower than that for which they were designed is by modifying the ignition advance, and this can be done only within very narrow limits set by overheating.

The engines of future generations of cars, could be designed to allow for the possibly inferior characteristics of the new fuels, by having for example, a lower compression ratio than that of present engines. Here again, however, there would have to be an increase in consumption (which might be as much as 10 % according to certain estimates) with possibly reduced levels of performance owing to the reduction in engine output. This increased consumption would naturally lead to an increased volume of exhaust gas, and thus, in absolute terms, to an increase in the emission of pollutants. The increase would be even greater if a manufacturer were to increase the cylinder capacity of his engines to compensate for the possible loss of performance mentioned above.

Furthermore, the lead deposited in the cylinders lubricates the valves and their seats. Present engine design takes this protective effect into account and the lead content in petrol cannot be reduced below a certain level without prejudicing the smooth running of these engines.

4. Emissions of lead in exhaust gases

During combustion the organic lead compounds are broken down by heat and pressure in the cylinder, and act as catalytic inhibitors. At the end of the combustion cycle, the lead forms mineral compounds with other elements present in the exhaust gases. These compounds are generally emitted in the form of lead halides which, at lower temperatures, form complexes with ammonium halides.

The size and the mass of the emitted particles depend on the operating conditions of the engine, its age and the state of the exhaust system. In a new exhaust system, the particles are deposited up to a certain level of saturation, and especially at low temperatures and gas velocities such as occur in town operation.

Part of these deposits may subsequently be expelled at higher temperatures and gas velocities.

The particles which pass directly into the air from the combustion chamber have a diameter of less than 5 microns, the majority less than 0.5 microns. On the other hand the diameter of particles initially deposited in the exhaust system and later expelled by mechanical or thermal effects is generally greater than 5 microns.

It is generally estimated that during the life of a car, between 70 % and 80 % of the lead in the petrol consumed is released in the exhaust, and approximately half the particles are less than 5 microns in diameter. However, these values vary widely.

5. Lead in the atmosphere

The lead emissions from motor vehicles constitute a large part of the total quantity of this element in the atmosphere, in particular in the atmosphere of our big cities. A survey recently carried out by a

committee of experts for the Commission and published in the report EUR 4882, gave the following results for the lead concentration in the atmosphere in the European Community.

These values are the result of continuous monitoring (24 hours per day) between 1 April 1971 and 31 March 1972.

<u>P l a c e</u>	<u>Value in micrograms per m³</u>
Rural areas	monthly average < 0.5 daily maxima < 1
Secondary cities	monthly average < 1
- residential areas	daily maximum < 2
- Heavy traffic points	not determined
Major cities	
- residential areas	monthly average < 2 daily maximum < 8
- heavy traffic points	monthly average < 6.5 daily maximum < 10

6. Effects on the human body of lead pollution in the air

Lead particles less than 5 microns in size can penetrate into the lungs. It is estimated that 25-50 % of these particles are deposited in the bronchia and the alveoles; the maximum rate of deposition is thought to occur with particles 0.5 - 1 micron in size. Almost all the particles thus deposited are absorbed and pass very quickly into the blood.

However, the inhaled lead constitutes only part - 10-40 % according to the experts - of the total lead in the human body. Considerable quantities are also ingested with food and drink - in Europe 200-500 micrograms daily.

Correlations between the lead concentration in the atmosphere and lead poisoning, or other biological indicators of lead poisoning, have not as yet been established with any certainty, but very active research is in progress.

The toxic effects of lead on man have been known for a long time, saturnism being one of the first industrial diseases to be recognized. But the clinical effects of saturnism become apparent only when massive quantities of lead are ingested and/or inhaled. With much lower exposures certain subclinical signs may appear, such as the partial inhibition of certain enzymes concerned in the synthesis of haemoglobin.

These subclinical signs have been observed in certain groups of workers who are exposed over long periods to the atmosphere of streets where the lead concentration is at its highest (policemen, roadworkers, road-sweepers), but no conclusions can be known as to the effect on the health of the people in question.

In the population as a whole, including sensitive groups such as children, an accumulation of lead, principally in the bones, is noted over the years; however, it has not as yet been possible to demonstrate the harmful effects on health of the accumulations usually encountered.

Meanwhile the evolution of the problem must be followed so that additional measures can be taken as soon as the necessity arises.

7. Effects on the oil industry of a reduction in the lead content of petrol

The reduction of the lead content of petrols has marked effects on their properties and, depending on the degree of reduction itself, would necessitate appreciable production changes, not only technical and structural but also financial and economic.

No new additive capable of satisfactorily replacing lead is at present in sight; furthermore, restrictions on the use of new base materials such as methanol, ethanol and the ethers are quite severe, and they are too expensive.

The remaining solutions entail modifications to the refining system. It is technically possible to produce a high RON fuel using processing plant the technology of which is already very well understood. In particular, higher standards of catalytic reforming are possible. This would permit an increase in the antiknock quality of the clear fuel but would increase the percentage of aromatics and reduce the output of the process.

Although the addition of light isomers in the formulation of petrols permits an appreciable improvement of their Delta R (100 °C) (1), their use would be governed by the volatility limits established for fuels. Alklation linked with the presence of catalytic cracking units can only play a limited role in view of the probable evolution of the structure of petroleum products consumption in Europe.

A detailed study was carried out by the Commission's departments in collaboration with experts from the petroleum and automobile sectors. The aim was to examine the effects on the Community oil market of the reduction of lead in petrol. The technical, industrial, financial and economic aspects of the problem are dealt with in a special report. Its conclusions can be summed up as follows:

Any reduction of lead levels in fuels would increase production costs, reduce flexibility in refinery production, and also necessitate considerable investment. Thus any programme to reduce lead levels should, as far as possible, have to be carried out in stages. It is important to note that if one assumes a gradual reduction of lead levels in petrol, a threshold will be met at 0.45-0.40 gr/l. Above this value, the modifications which would have to be made in the refining process would be technically and economically feasible. But, once this threshold was crossed, any difficulty encountered, whether technical or economic, would be on a larger scale, and large and costly changes would have to be made in the refining process.

8. The effects of a reduction in lead content of petrol on the Community's crude oil supply

The effects of any such reduction on the supply of crude oil to the European oil industry are an important factor at a time when the danger of a shortage of primary energy is being discussed seriously and when

(1) Delta R (100 °C) - difference between the research octane number of a fuel and that of its fraction distilled at 100°C. Criterion for the antiknock quality of a fuel at low engine speed.

some experts view the Community's long-term crude oil supply situation with pessimism. Additional crude oil requirements may result for two reasons :

- a) the reduction of the output of refining installations, if the octane level of petrols has to be maintained in spite of the reduction of their lead content. Little data is available at present, but initial estimates suggest an additional requirement of about 1 - 4 % for a reduction to 0.4 gr/l, and 3 - 8 % for a reduction for all types of petrol to approximately 0.15 gr/l.
- b) the increase in engine consumption, for the reasons set out in section 3; this might sometimes be as much as 10 %.

In view of the vast quantity of crude oil necessary to produce the petrol consumed in the Community (approximately 63 million metric tons in 1971), very careful thought should be given to the question of just how far these additional requirements could be accepted. In all the Member States, any further increase in the consumption of crude oil represents an increase in imports, and this has a significant influence on trade balances.

9. Regulations in the United States

In February 1972, the Environmental Protection Agency (EPA) made public for the first time its intention of establishing, under the Clean Air Act, regulations aiming at the marketing of a new lead-free type of petrol and the phased reduction of the lead content in other qualities of petrol over the period 1 January 1974 - 1 January 1977.

In this announcement, interested circles were invited, in accordance with United States practice, to comment on this proposal in public hearings or in writing.

As a result of the large number of submissions received, the EPA published in January 1973 regulations requiring that as from 1 July 1974 at least one quality of lead-free petrol with a RON of 91 should be available to users, and amending its proposal for the phased reduction of the lead content in the other petrol qualities, by assigning dates for entry into force one year later than originally planned; these dates are set out in the table in section 1.

The argument of the EPA in requiring a lead-free petrol was that it was expecting the generalized use of catalytic devices in order to satisfy the limits for carbon monoxide, unburnt hydrocarbons and nitrogen oxides which it was intending to impose for 1975 and that these devices would not tolerate lead.

Subsequently, a certain change in the attitude of the EPA to the other vehicle emissions has been noticeable. Following a public hearing in March 1973 of the automobile industry which had called for a one year postponement of the regulations planned for 1975, the EPA modified its requirements by introducing provisional standards for 1975.

These provisional standards, which are in general less severe than those originally proposed, make a distinction between the State of California, considered to be especially threatened, and the rest of the country. The EPA assumes that in order to comply with these new standards all vehicles sold in California would have to be fitted with catalytic afterburner devices, but that most the models sold elsewhere would be able to do without them. In this way the EPA believes that for the moment it can satisfy the demands of environmental protection while avoiding insurmountable economic problems.

The suggestion by the EPA that the US Congress should reconsider its decision about the reduction of nitrogen oxide emissions is very important. The most recent estimate of the danger to public health of these pollutants shows that their 90 % reduction by 1976 is no longer justifiable. It was precisely this reduction which posed the greatest technological problems, owing to the need to use catalytic devices which could not tolerate the presence of lead in fuels.

10. Community action considered

Although the preceding chapters show that atmospheric pollution by lead does not present any immediate threat to public health, even in large towns, Community action to limit the lead content of petrol is advisable for the following reasons :

- since rules designed to reduce the lead content of petrol are being prepared in several countries, and are even in force in some, and since the discrepancies between these laws are liable to create technical barriers to trade, action should be taken immediately to harmonize these divergent rules.
- since the number of cars is continually increasing, there is an increase in the consumption of petrol and therefore in the total volume of lead emitted. Under these circumstances, in order to keep air pollution caused by lead down to its present level, the lead content of petrol should be reduced in the same proportion, as other methods of reducing lead emissions could not be imposed by law so quickly. Lead traps, for example, are sufficiently perfected to guarantee at least a 70 % reduction in emissions of lead particles throughout their working life. A more detailed

study has yet to be made by the industry concerned of the task of producing a sufficient quantity for installation in all new cars from a specific date.

Community measures designed to reduce the lead in fuels should however observe certain economic imperatives, as the European Parliament indicated in its Resolution of 6 July 1972. They should also ensure that this reduction, especially if imposed relatively quickly, does not cause the oil industry to modify the composition of petrols, in order to maintain the required quality, in such a way as to increase the emissions of other pollutants to a level harmful to public health.

For these reasons, the Commission proposes this Directive which, as an initial stage, provides for a reduction of the lead content of all qualities of petrol to 0.4 gr/l. This reduction still represents a considerable step forward for the Community as a whole, having regard to the laws at present in force in certain Member States. The proposed limits are also in line with the above-mentioned Resolution of the European Parliament.

The Commission also considered it appropriate to fix, as a guide, a limiting value for regular-quality petrol, mainly as a pointer for the longer term policy in the oil industry in deciding future petrol blends.

In view of the present regulations on this matter in the Member States, the Commission considers that it should not provide intermediate stages for reaching the final values stipulated in this Directive. It intends thereby to allow Member States to take the measures most appropriate to their individual situation for complying with the values and time-limits laid down in the Directive.

If, at a future date, amendments to Directive 220 of 20 March 1970 on the approximation of the laws of the Member States on the limitation of the emission of unburnt carbon monoxide and hydrocarbons from spark ignition engines were to result in limits which necessitated the use of catalytic after-burner devices or introduced limits on the emission of oxides of nitrogen, which also require this kind of device, and if these devices could function with only a lead-free petrol or one with a very low lead content, the Commission would take the measures required to adapt this Directive according to the procedures laid down.

The limits now proposed represent a first important and realistic step in the present circumstances under the Commission's action programme for solving the entire problem of air pollution from motor vehicles.

The Commission would certainly propose effective measures if the studies and research at present being conducted into both the health and technical aspects in collaboration with Member States showed that the present levels of lead constituted a threat to public health. If such a situation were to arise in a few years, without necessitating any significant reduction in the emission of other pollutants, the Commission could consider using the lead traps referred to above, which would by this time have reached the industrial production stage.

The Commission considers that within a few years and at the latest before the end of 1979 it will have available enough basic data of a scientific, technical and economic nature to propose an overall solution to the problem of lead in petrol.

To this end it will examine the following aspects in collaboration with Member States and interested bodies and with the aid of surveys in progress, or planned, which have been initiated with other organisations, and it will make a biennial report to the Council on:

- the effect of this directive in the first instance on air pollution, on motor design and chiefly on vehicles already in circulation as well as on petrol production in order that any special difficulties which could arise in simple refineries can be identified,
- progress attained in the development of systems for the lowering of gaseous emission from motor vehicles, of techniques of propulsion and of methods of production of low pollution fuels,
- the evaluation of concentration of different pollutants in the atmosphere of European cities and the effect on public health. The Commission shall consider chiefly lead concentration in the atmosphere with the help of measuring stations which have been set up as part of the above mentioned scheme.

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 national laws concerning the composition of petrol, and in particular, the rules governing the limitation of the lead content in motor vehicle petrol, vary from one Member State to another; whereas such disparities create barriers to intra-Community trade; whereas such disparities consequently have direct repercussions on the proper functioning of the common market;

Whereas the protection and improvement of public health currently constitutes a major preoccupation common to all industrialized countries and pollution caused by products emitted in the exhaust gas of vehicles has reached an alarming level owing to the continuous increase in the density of motor traffic; whereas, following the introduction of measures in the Council Directive of 20 March 1970 designed to curb air pollution caused by the emission of carbon monoxide and unburned hydrocarbons from motor vehicles, it is now necessary to tackle the problem of lead particle emissions by such vehicles, the lead in question deriving from plumbiferous petrol additives acting as an anti-knock;

Whereas, despite the fact that in the present state of scientific knowledge there is no evidence to prove that existing concentrations of lead in the atmosphere constitute a danger to public health, it is nevertheless necessary to ensure that these concentrations do not increase as a result of the growing density of traffic and, accordingly, to take precautionary measures for the purpose of limiting the lead content in petrols;

Whereas restrictions limiting the lead content in petrol to about 0.4 g/l are already in force or in preparation in certain Member States, whilst in others the tolerated content is even higher than the figure quoted; whereas it is necessary accordingly that this Directive be confined to laying down definitive values, without any stipulations regarding the intermediate stages leading up to their adoption, thus leaving the Member States themselves free to introduce the measures envisaged or to take any other such measures as may be most appropriate in a domestic context in order to conform with the definitive values within the time limit set by the Directive; whereas these measures may be introduced by the Member States prior to the expiry of the time limit;

Whereas the financial, economic, industrial and qualitative effects of a reduction to 0.40 g/l of the level of lead in petrols have demonstrated that such a reduction is possible within a relatively short period without any undue repercussions on the Community petroleum market or its structure;

Whereas it is also advisable that an upper guideline value be fixed in respect of regular petrol, pending the outcome of studies currently being undertaken with a view to formulating a more detailed definition of the composition of petrols which will need to be available over the longer term;

Whereas the design of an engine and the composition of the petrol which it consumes are directly interdependent; whereas the lead content must be limited in such a way as to ensure that the petrol offered on the Community market should, without any undue increase in the production cost, possess the anti-knock qualities necessary to meet the octane requirements of engines in current use; whereas, pending the outcome of studies currently being undertaken at European level with the aim of defining more satisfactory criteria, it is sufficient to refer to existing criteria, i.e., the "research octane" rating and the "engine octane" rating, when defining these anti-knock qualities;

Whereas these types of petrol will nevertheless still need to be available until such time as they are no longer required to meet the needs of existing motor vehicles (i.e., until the gradual and complete phasing-out of these vehicles), whereupon new motor vehicles will come onto the market employing a different type of fuel with lower anti-knock qualities;

Whereas lead is only one of the constituent elements in the composition of petrol; whereas the reduction of this element must not have the effect of aggravating the air pollution which would be one of the main consequences of any modification in composition;

Whereas the advance of knowledge regarding the protection of human health, on the one hand, and the development of techniques of propulsion and the reduction of engine pollution emission, on the other, might necessitate amendments to the provisions of this Directive, notably if such modifications led to the use of systems which were based on a catalytic process and whose operational requirements were such that they called for lead-free petrols or petrols having lower lead levels than those currently provided for;

HAS ADOPTED THIS DIRECTIVE :

Article 1

For the purpose of this Directive :

- a) "petrol" means :
any fuel intended for the operation of internal combustion spark-ignited engines used for the propulsion of vehicles;
- b) "premium petrol" means :
any petrol with a "research octane" rating of not less than 98 and a "motor octane" rating of not less than 87;
- c) "regular petrol" means :
any petrol with a "research octane" rating of not less than 90.

Article 2

1. As from 1 January 1976, petrol shall be placed on the Community internal market only where its lead compound content, calculated as lead, does not exceed 0.40 g/l.
2. As from 1 January 1973, regular petrol shall be placed on the Community internal market only where its lead contents does not exceed 0.15 g/l. The provisions of paragraph 1 shall continue to apply in the case of premium petrol.
3. As from 1 January 1978, intermediate grade petrol between premium and regular quantities shall be placed on the Community internal market only where its lead compound content, calculated in terms of lead, does not exceed the concentration of an equivalent blending of those two qualities.
4. As from the date of adoption of the present directive, the Commission, wishing to continue its efforts to curb air pollution caused by motor vehicles, will report biennially to the Council on:
 - a) the effects of implementation of this directive;
 - b) the evolution of systems for the lowering of emissions other than lead content in exhaust gases (1), of techniques of propulsion of vehicles, and of methods of production of low pollution fuels;
 - c) the evolution of concentration of different pollutants, particularly of lead content in atmosphere of European cities and their effect on public health.

In addition, depending on data gathered during the progress of these surveys, the Commission will formulate, as soon as possible, all necessary proposals.

At the latest before 1 January 1980 the Commission will present proposals for an overall solution of the problem of lead content in petrol.

(1) Council Directive no 220/70 of 20 March 1970.

Article 3

The reduction of the lead content in pursuance of Article 2 shall not be such as to lead to any modification in the composition of the petrol which is likely to increase significantly the quantities of other pollutants currently emitted in the exhaust gas. At the very least, the composition of the petrol shall be such as to conform with the limits stipulated in Directive n° 220/70 of 20 March 1970.

To this end, the Member States shall take all steps necessary to ensure that measurements are made in respect of pollutants emitted in the exhaust gas. The data thus obtained shall be communicated to the Commission.

Article 4

1. Member States shall not prohibit, restrict or prevent the marketing and use of a petrol on the grounds of its lead content:
 - .. as from 1 January 1976, where the petrol in question conforms with the provisions of Article 2 (1) of this Directive;
 - as from 1 January 1978, where the petrol in question conforms with the provisions of Article 2 (2) and (3) of this Directive.
2. By way of derogation from the first subparagraph of the preceding paragraph Member States shall, prior to 1 January 1978, be empowered to apply the provisions of Article 2 (2) and (3).

Article 5

Octane ratings and the lead content in petrol shall be measured in accordance with the control procedures set out in Annex I.

Article 6

Where a Member State establishes, on the basis of an analysis performed in accordance with the control procedures described in Article 5, that a petrol fails to conform with the requirements of Article 2, it shall thereupon take such measures as are necessary to ensure that these requirements are fulfilled.

Article 7

1. Member States shall introduce the provisions laid down by law, regulation or administrative action which are necessary to comply with this Directive within six months from the time of notification of the Directive and shall forthwith inform the Commission accordingly.

2. Upon notification of this Directive, Member States shall also inform the Commission, allowing sufficient time for the latter to make its own observations, of any subsequent draft provisions of an essential nature laid down by law, regulation or administrative action, which they propose to adopt in the field governed by the Directive.

Article 8

This Directive is addressed to the Member States.

Done at,

For the Council

The President

ANNEX I

REFERENCE METHODS

The "research octane" rating is determined in accordance with ASTM (American Society for Testing and Materials) standard D 2722-74 in a CFR (Cooperative Fuel Research Committee) test engine. The results of individual measurements shall be interpreted on the basis of the method described in BS standard 4040 (1971), published by the British Standards Institution.

The "engine octane" rating is determined in accordance with ASTM standard D 2723-71 in the CFR engine. The results of individual measurements shall be interpreted on the basis of the method described in BS standard 4040 (1971), published by the British Standards Institution.

The lead content in the petrol shall be measured in accordance with the control procedure laid down in European Standard proposal Pr EN 13 of 6 December 1972 ("Method for measuring the lead content in petrols") of the European Standardization Committee (ESC). The results of individual measurements shall be interpreted on the basis of the method described in BS standard 4040 (1971), published by the British Standards Institution.

The petrol samples used for the purpose of these measurements shall be taken from ordinary filling stations.