COMMISSION

COMMISSION DIRECTIVE

of 14 July 1978

adapting to technical progress Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against pollution of the air by gases from positive ignition engines installed in motor vehicles

(78/665/EEC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers (1), as amended by the Act of Accession, and in particular Articles 11, 12 and 13 thereof,

Having regard to Council Directive 70/220/EEC of 20 March 1970 on the approximation of the laws of the Member States relating to measures to be taken against pollution of the air by gases from positive-ignition engines of motor vehicles (2), as amended by the Act of Accession, and in particular Article 5 thereof,

Whereas the first European Community programme of action on the environment approved on 22 November 1973 provides that Directives may be amended in order to take account of the most recent scientific progress and more specifically as regards the pollution of air by gases from spark-ignition engines;

Whereas the maximum permissible limits for carbon monoxide and unburnt hydrocarbons emitted by spark-ignition engines fitted to motor vehicles were laid down in Directive 70/220/EEC; whereas these limits were initially reduced by Council Directive 74/290/EEC of 28 May 1974 (3), and permissible limits for nitrogen oxide emissions were added by Commission Directive 77/102/EEC of 30 November 1976 (4);

Whereas the requirements relating to the protection of public health and the environment require a further short term reduction in these limits; whereas the technical advances made in engine design now enable a reduction of this type to be made without running counter to Community policy aims in other fields and in particular that of the rational use of energy;

Whereas the measures provided for in this Directive are in accordance with the opinion of the Committee on the Adaptation to Technical Progress of the Directives aimed at the Removal of Technical Barriers to Trade in the Motor-Vehicle Sector,

HAS ADOPTED THIS DIRECTIVE:

Article 1

Annexes I, II, III, V and VII to Directive 70/220/EEC, as amended by Directive 74/290/EEC and by Directive 77/102/EEC, are hereby amended in accordance with the Annex to this Directive.

(1) OJ No L 42, 23. 2. 1970, p. 1.
(2) OJ No L 76, 6. 4. 1970, p. 1.
(3) OJ No L 159, 15. 6. 1974, p. 61.
(4) OJ No L 32, 3. 2. 1977, p. 32.

Article 2

1. From 1 April 1979, the Member States shall neither, on grounds relating to air pollution by gases from an engine:

— refuse to grant EEC type-approval, or to issue the documents referred to in the last indent of Article 10 (1) of Directive 70/156/EEC, or to grant national type-approval of a type of motor vehicle, nor

— prohibit the entry into service of such vehicles,

where the level of gaseous pollutants emitted from this type of motor vehicle or from such vehicles meets the requirements of Directive 70/220/EEC, as last amended by this Directive.

2. From 1 October 1979, Member States:

— shall no longer issue the document provided for in the last indent of Article 10 (1) of Directive 70/156/EEC in respect of a type of motor vehicle which emits gaseous pollutants at levels which do not meet the requirements of Directive 70/220/EEC, as last amended by this Directive,

— may refuse national type-approval of a type of motor vehicle which emits gaseous pollutants at levels which do not meet the requirements of Directive 70/220/EEC, as last amended by this Directive.

3. From 1 October 1981, Member States may prohibit the entry into service of vehicles which emit gaseous pollutants at levels which do not meet the requirements of Directive 70/220/EEC, as last amended by this Directive.

4. Before 1 January 1979, Member States shall put into force the provisions required in order to comply with this Directive and shall forthwith inform the Commission thereof.

Article 3

This Directive is addressed to the Member States.

Done at Brussels, 14 July 1978.

For the Commission

Étienne DAVIGNON

Member of the Commission

ANNEX

AMENDMENTS TO THE ANNEXES TO DIRECTIVE 70/220/EEC, AS AMENDED BY DIRECTIVES 74/290/EEC AND 77/102/EEC

I. General provisions relating to units of measurement

The provisions of Directive 70/220/EEC shall be aligned with Directive 71/354/EEC, as last amended by Directive 76/770/EEC, relating to units of measurement.

In the Annexes to Directive 70/220/EEC:

— the words 'reference weight' and 'maximum weight' shall be replaced by the words 'reference mass' and 'maximum mass';

— the pressure values indicated in millimetres of mercury and in millimetres water gauge shall be replaced by the values indicated in millibars in accordance with the formula:

  — 1 mm Hg = 1·33322 mbar,

  — 1 mm H_2O = 0·0980665 mbar;

— the power values shall be indicated in kilowatts instead of horsepower or chevaux vapeur in accordance with the formula:

  — 1 CV = 0·735498 kW,

  — 1 hp = 0·7457 kW.

II. Individual provisions

ANNEX I

DEFINITIONS, APPLICATION FOR EEC TYPE-APPROVAL AND TEST SPECIFICATIONS

Point 1.2 to read:

'1.2. **Reference mass**

"Reference mass" means the mass of the vehicle in running order less the uniform mass of the driver of 75 kg and increased by a uniform mass of 100 kg.'

Add a new point 1.2.1 as follows:

'1.2.1. "Mass of the vehicle in running order" means the mass defined under point 2.6 of Annex I to Directive 70/156/EEC.'

In point 3.2.1.1.4 the table shall be replaced by the following:

Reference mass (kilograms) RW	Mass of carbon monoxide (grams per test) L1	Mass of hydrocarbons (grams per test) L2	Mass of nitrogen oxides expressed in No_2 equivalent (grams per test) L3
RW ≤ 750	65	6·0	8·5
750 < RW ≤ 850	71	6·3	8·5
850 < RW ≤ 1 020	76	6·5	8·5
1 020 < RW ≤ 1 250	87	7·1	10·2
1 250 < RW ≤ 1 470	99	7·6	11·9
1 470 < RW ≤ 1 700	110	8·1	12·3
1 700 < RW ≤ 1 930	121	8·6	12·8
1 930 < RW ≤ 2 150	132	9·1	13·2
2 150 < RW	143	9·6	13·6

Point 3.2.1.1.4.1 to read:

'3.2.1.1.4.1. However, until 1 October 1981, for type-approval in respect of emissions of vehicles of category M_1 equipped with automatic transmissions, the limits L3 for nitrogen-oxide emissions given in the table in point 3.2.1.1.4 shall be multiplied by the factor 1·25.

Concerning vehicles other than those of category M_1, the limits for nitrogen-oxide emissions remain those given in point 3.2.1.1.4 of Directive 77/102/EEC, multiplied by the factor 1·25.'

Point 3.2.1.2.2 to read:

'3.2.1.2.2. The carbon monoxide content by volume of the exhaust gases emitted with the engine idling must not exceed 3·5 %. When a check is made in accordance with the provisions of Annex IV, under operating conditions not in conformity with the standards recommended by the manufacturer (configuration of the adjustment components), the maximum content measured by volume shall not exceed 4·5 %.'

Point 4.2.2 'Ratio E' shall be as follows: 'E ≤ 8 %'.

Point 4.2.3 'Ratio E' shall be as follows: 'E > 8 % and E ≤ 13 %'.

In point 5.1.1.1 the table shall be replaced by the following:

Reference mass (kilograms) RW	Mass of carbon monoxide (grams per test) L1	Mass of hydrocarbons (grams per test) L2	Mass of nitrogen oxides expressed in NO_2 equivalent (grams per test) L3
≤ 750	78	7·8	10·2
750 < RW ≤ 850	85	8·2	10·2
850 < RW ≤ 1 020	91	8·5	10·2
1 020 < RW ≤ 1 250	104	9·2	12·2
1 250 < RW ≤ 1 470	119	9·9	14·3
1 470 < RW ≤ 1 700	132	10·5	14·8
1 700 < RW ≤ 1 930	145	11·2	15·4
1 930 < RW ≤ 2 150	158	11·8	15·8
2 150 < RW	172	12·5	16·3

Point 5.1.1.1.1 to read:

'5.1.1.1.1. For vehicles of category M_1 equipped with automatic transmissions which have been granted type-approval in respect of emissions before 1 October 1981, the limits L3 for nitrogen-oxide emissions given in the table in point 5.1.1.1 of this Directive shall be multiplied by the factor 1·25.

Concerning vehicles other than those of category M_1, the limits for nitrogen-oxide emissions remain those given in point 5.1.1.1 of Directive 77/102/EEC, multiplied by the factor 1·25.'

ANNEX II

ESSENTIAL CHARACTERISTICS OF THE ENGINE AND INFORMATION CONCERNING THE CONDUCT OF TESTS

Add the following new items:

'3.2.1.3.6. Idling system. Description of settings and relevant requirements in order to comply with point 3.2.1.2.2 of Annex I (configuration of adjustment components).'

'8.1.1. Carbon monoxide content by volume in the exhaust gas, with the engine idling ... % (manufacturer's standard).'

ANNEX III

TYPE 1 TEST

To point 1.3.1 add the following sentence:

'The second, third and fourth gears may also be used when the driving instructions recommend starting in second gear on level ground, or when first gear is therein defined as a gear reserved for cross-country driving, crawling or towing.'

To point 2.1.4 add the following sentence:

'This requirement also applies, in particular, to the settings for idling (rotational speed and carbon monoxide content of the exhaust gases), for the automatic choke and for the exhaust-gas cleaning system.'

Point 2.1.5 to read:

'2.1.5. The intake system of the vehicle tested shall be fitted, beyond the throttle, with a connection making it possible to measure accurately the vacuum in the intake pipe.'

Point 2.1.7 (new) to read:

'2.1.7. Vehicles designed to operate with catalytic convertors shall be tested with the catalyst removed although these devices may be fitted to vehicles produced to the type approved.'

Point 3.2.4 to read:

'3.2.4. A cooling condenser shall be installed between the tail pipe and the inlet valve to the bag or bags, so that the temperature of the gases at the condenser outlet is not reduced below 5 °C. The cooling system should be such as to avoid any condensed water entrainment by the gases flowing through it, and the humidity of the gases in the collecting bag or bags must be less than 90 % at 20 °C.'

In point 3.2.5, for the last sentence, read:

'The volume of the section of the sampling tube leading into the bag shall be less than 0·03 m^3.'

Point 4.1.2 to read:

'4.1.2. The brake is adjusted in the following way:'

The existing points 4.1.2, 4.1.3 and 4.1.4 become points 4.1.2.1, 4.1.2.2 and 4.1.2.3.

Point 4.1.2.4 (new) to read:

'4.1.2.4. Other methods of measuring the power necessary for propelling the vehicle (e.g. driveline torque measurement, deceleration measurement, etc.) will also be permitted.'

Point 4.1.2.5 (new) to read:

'4.1.2.5. The brake can only be adjusted on the basis of road tests if the conditions of air pressure and temperature, on the road and at the location of the dynamometer bench, do not differ by more than ± 15 mbar and ± 8 °C.'

Point 4.1.3 (new) to read:

'4.1.3. If the preceding method is not applicable, the bench is regulated in order to absorb the power exerted by the driving wheels at a constant speed of 50 km/h in accordance with the provisions of the table in point 4.2. This power is determined according to the method indicated in Annex VII.'

Point 4.1.3.1 (new) to read:

'4.1.3.1. In the case of vehicles other than those of category M_1, vehicles with a reference mass of more than 1 700 kg, or vehicles all of whose wheels are driven, the power values given in the table shall be multiplied by the factor 1·3.'

In point 4.2 the table shall be replaced by the following:

Reference mass (RW) of vehicle (kilograms)	Equivalent inertias (kilograms)	Power absorbed by the dynamometer (kilowatts)
≤ 750	680	1·8
750 < RW ≤ 850	800	2·0
850 < RW ≤ 1 020	910	2·2
1 020 < RW ≤ 1 250	1 130	2·4
1 250 < RW ≤ 1 470	1 360	2·7
1 470 < RW ≤ 1 700	1 590	2·9
1 700 < RW ≤ 1 930	1 810	3·1
1 930 < RW ≤ 2 150	2 040	3·3
2 150 < RW ≤ 2 380	2 270	3·5
2 380 < RW ≤ 2 610	2 270	3·6
2 610 < RW	2 270	3·7

To point 4.4 add the following sentence:

'For vehicles with a reference mass of more than 1 700 kg whose engine is fitted with a device for the dilution of exhaust gases (an air pump, for example), a back-pressure not exceeding 10 mbar is allowed.'

ANNEX V

TYPE III TEST

In point 2.2 the table shall be replaced by the following:

Condition No	Vehicle speed (km/h)	Weighting factor	Power absorbed by brake
1	Idling	0·25	Nil
2	50 ± 2	0·25	That corresponding to the setting for type-I test
3	50 ± 2	0·50	That for condition No 2, multiplied by the factor 1·7

Delète point 2.3.

Point 2.4: Re-number as 2.3.

A new Annex VII as follows is added:

'ANNEX VII

METHOD OF CALIBRATING THE DYNAMOMETER

1. This Annex describes the method to be used to determine the relationship between the indicated power of the dynamometer and the actual power absorbed by the dynamometer.

   The actual power absorbed by the dynamometer (P_a) is the power absorbed by the brake, plus the power absorbed due to friction within the dynamometer, but not the power loss due to the friction between the tyre and roller.

2. This method disregards the variations in the internal friction of the roller(s), which are due to the load applied by the vehicle.

3. According to this method the power absorbed is determined on the basis of the deceleration times of the roller(s). The difference between the deceleration time of the driven roller and that of the free roller can be disregarded in the case of two-roller dynamometers, i.e. the time to be taken into consideration is that of the driven roller.

4. The following procedure will be used:

4.1. Use a flywheel or any other means of simulating the inertia of the mass of the vehicle. Select for this purpose the inertial mass with which the dynamometer is most commonly used.

4.2. Bring the dynamometer up to speed by placing the vehicle on the rollers, or by any other method.

4.3. A fifth wheel, revolution counter or any other suitable device may be used to measure the speed(s) of the roller(s).

4.4. Bring the roller(s) to a speed of 50 km/h and apply a suitable power to the dynamometer in accordance with the table in point 4.2 of Annex III.

4.5. Note the power indicated (P_i).

4.6. Bring the roller(s) to a speed of at least 60 km/h.

4.7. Disengage the device used to bring the dynamometer up to speed (there must be no vehicle on the roller(s)).

4.8. Note the times taken for the speed of the roller(s) to decrease from 55 to 45 km/h.

4.9. The power P_a is to be calculated using the formula:

$$P_a = \frac{M_1 \cdot (V_1^2 - V_2^2)}{2\,000 \cdot t} = \frac{0{\cdot}03857 \cdot M_1}{t}$$

where:

P_a = power absorbed by the dynamometer in kW,

M_1 = equivalent inertia of the driven roller in kg,

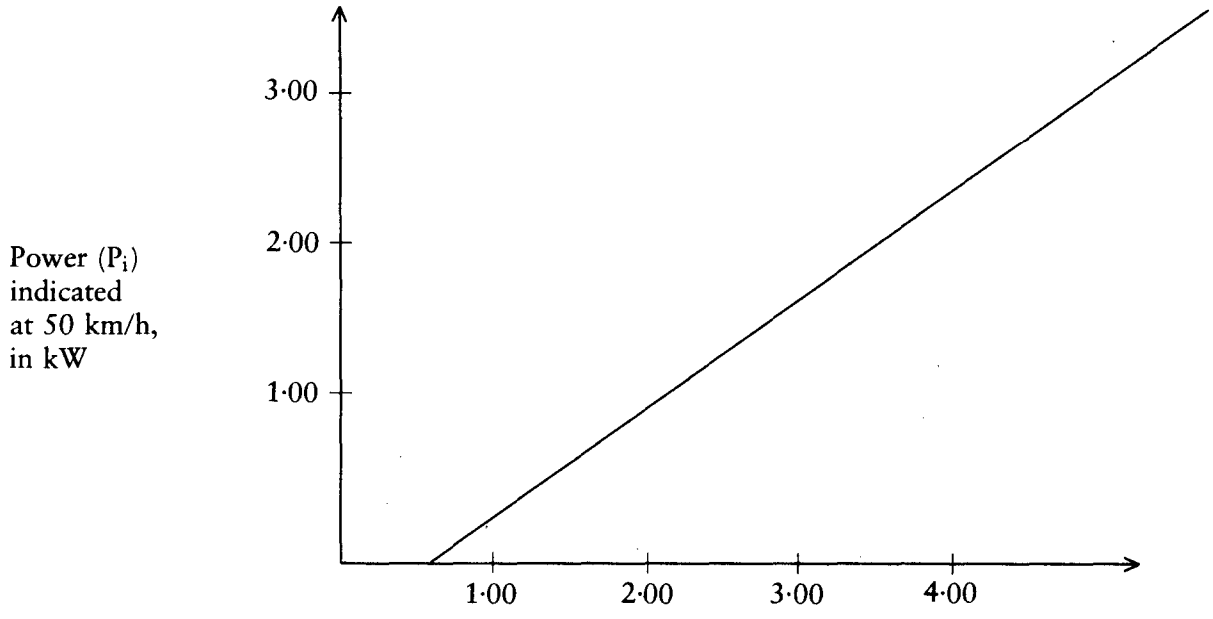
V_1 = initial speed in m/s (55 km/h = 15·28 m/s),

V_2 = final speed in m/s (45 km/h = 12·50 m/s),

t = time needed by the roller(s) to slow down from 55 to 45 km/h.

4.10. Repeat operations 4.4 to 4.9 a sufficient number of times to cover the range of powers set out in Annexes III and V.

4.11. Diagram showing the indicated power as a function of the power absorbed at 50 km/h.



The existing Annex VII becomes Annex VIII.

ANNEX VIII

The title to read:

'MODEL

Annex to the EEC vehicle type-approval certificate concerning pollution of the air by gases from positive-ignition engines

Articles 4 (2) and 10 of Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers)

Having regard to the modifications in accordance with Directive 78/665/EEC'

Point 5 to read:

'5. Reference mass of vehicle .....'

Delete point 5.1.

Point 7.3 to read:

'7.3. Transmission ratio:

— first gear .....

— second gear .....

— third gear .....

Final drive ratio .....

Tyres:

— dimensions .....

— dynamic rolling circumference .....'