

Council Directive of 20 March 1970 on the approximation of the laws of the Member States on measures to be taken against air pollution by emissions from motor vehicles (70/220/EEC) (repealed)

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[^{F1}ANNEX I

[^{F2}SCOPE, DEFINITIONS, APPLICATION FOR EC TYPE-APPROVAL, GRANTING OF EC TYPE-APPROVAL, REQUIREMENTS AND TESTS, EXTENSION OF EC TYPE-APPROVAL, CONFORMITY OF PRODUCTION AND IN-SERVICE VEHICLES, ON-BOARD DIAGNOSTIC (OBD) SYSTEMS]

Textual Amendments

- F1** Substituted by [Council Directive of 26 June 1991 amending Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles \(91/441/EEC\)](#).
- F2** Substituted by [Directive 98/69/EC of the European Parliament and of the Council of 13 October 1998 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC](#).

1. SCOPE

[^{F2}This Directive applies to

- tailpipe emissions at normal and low ambient temperature, evaporative emissions, emissions of crankcase gases, the durability of anti-pollution devices and on-board diagnostic (OBD) systems of motor vehicles equipped with positive-ignition engines,
- and
- tailpipe emissions, the durability of anti-pollution devices and on-board diagnostic (OBD) systems of vehicles of category M₁ and N₁⁽¹⁾, equipped with compression-ignition engines,

covered by Article 1 of Directive 70/220/EEC in the version of Directive 83/351/EEC, with the exception of those vehicles of categories N₁ for which type-approval has been granted pursuant to Directive 88/77/EEC⁽²⁾.]

At the request of the manufacturers, type-approval pursuant to this Directive may be extended from M₁ or N₁ vehicles equipped with compression ignition engines which have already been type-approved, to M₂ and N₂ vehicles having a reference mass not exceeding 2 840 kg and meeting the conditions of section 6 of this Annex (extension of EEC type-approval).

[^{F3}This Directive also applies to the EC type-approval procedure for replacement catalytic converters as separate technical units intended to be fitted on vehicles of category M₁ and N₁.]

Textual Amendments

- F3** Substituted by [Commission Directive 2002/80/EC of 3 October 2002 adapting to technical progress Council Directive 70/220/EEC relating to measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\)](#).

2. DEFINITIONS

For the purposes of this Directive:

- 2.1. 'Vehicle type' with regard to the tailpipe emissions from the engine, means a category of power-driven vehicles which do not differ in such essential respects as:

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- 2.1.1. the equivalent inertia determined in relation to the reference mass as prescribed in section 5.1 of Annex III; and
- 2.1.2. the engine and vehicle characteristics as defined in Annex II.
- 2.2. '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.
- 2.2.1. 'Mass of the vehicle in running order' means the mass defined in section 2.6 of Annex I to Directive 70/156/EEC.
- 2.3. 'Maximum mass' means the mass defined in section 2.7 of Annex I to Directive 70/156/EEC.
- [^{F4}2.4. 'Gaseous pollutants' means the exhaust gas emissions of carbon monoxide, oxides of nitrogen, expressed in nitrogen dioxide (NO₂) equivalent, and hydrocarbons assuming ratio of:
- C₁H_{1.85} for petrol,
 - C₁H_{1.86} for diesel,
 - C₁H_{2.525} for LPG,
 - CH₄ for NG.]

Textual Amendments

- F4** Substituted by [Commission Directive 98/77/EC of 2 October 1998 adapting to technical progress Council Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\)](#).

- 2.5. 'Particulate pollutants' means components of the exhaust gas which are removed from the diluted exhaust gas at a maximum temperature of 325 K (52 °C) by means of the filters described in Annex III.
- 2.6. 'Tailpipe emissions' means:
- for positive-ignition engines, the emission of gaseous pollutants,
 - for compression-ignition engines, the emission of gaseous and particulate pollutants.
- 2.7. 'Evaporative emissions' means the hydrocarbon vapours lost from the fuel system of a motor vehicle other than those from tailpipe emissions.
- 2.7.1. 'Tank breathing losses' are hydrocarbon emissions caused by temperature changes in the fuel tank (assuming a ratio of C₁H_{2.33}).
- 2.7.2. 'Hot soak losses' are hydrocarbon emissions arising from the fuel system of a stationary vehicle after a period of driving (assuming a ratio of C₁H_{2.20}).
- 2.8. 'Engine crankcase' means the spaces in, or external to, an engine which are connected to the oil sump by internal or external ducts through which gases and vapours can escape.
- 2.9. 'Cold start device' means a device which temporarily enriches the air/fuel mixture of the engine thus assisting the engine to start.

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- 2.10. ‘Starting aid’ means a device which assists the engine to start without enrichment of the air/fuel mixture of the engine, e.g. glow plugs, modifications to the injection timing.
- 2.11. ‘Engine capacity’ means:
- 2.11.1. for reciprocating piston engines, the nominal engine swept volume,
- 2.11.2. for rotary piston (Wankel) engines, double the nominal engine swept volume.
- 2.12. ‘Anti-pollution device’ means those components of a vehicle that control and/or limit tailpipe and evaporative emissions.
- [^{F5}2.13. ‘OBD’ an on-board diagnostic system for emission control which has the capability of identifying the likely area of malfunction by means of fault codes stored in computer memory.

Textual Amendments

F5 Inserted by [Directive 98/69/EC of the European Parliament and of the Council of 13 October 1998 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC](#).

- 2.14. ‘In-service test’ means the test and evaluation of conformity conducted in accordance with section 7.1.7 of this Annex.
- 2.15. ‘Properly maintained and used’ means, for the purpose of a test vehicle, that such a vehicle satisfies the criteria for acceptance of a selected vehicle laid down in section 2 of Appendix 3 to this Annex.
- 2.16. ‘Defeat device’ means any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum or any other parameter for the purpose of activating, modulating, delaying or deactivating the operation of any part of the emission control system, that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use. Such an element of design may not be considered a defeat device if:
- I. the need for the device is justified in terms of protecting the engine against damage or accident and for safe operation of the vehicle, or
- II. the device does not function beyond the requirements of engine starting, or
- III. conditions are substantially included in the Type I or Type VI test procedures.]
- [^{F6}[^{F3}2.17. ‘Original equipment catalytic converter’, means a catalytic converter or an assembly of catalytic converters covered by the type-approval delivered for the vehicle and which are indicated in point 1.10 of the Appendix to Annex X to this Directive.

Textual Amendments

F6 Inserted by [Commission Directive 98/77/EC of 2 October 1998 adapting to technical progress Council Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\)](#).

- 2.18. ‘Replacement catalytic converter’ means a catalytic converter or an assembly of catalytic converters intended to replace an original equipment catalytic converter on a vehicle approved according to Directive 70/220/EEC which can be approved as a separate technical unit as defined in Article 4(1)(d) of Directive 70/156/EEC.
- 2.19. ‘Original replacement catalytic converter’ means a catalytic converter or an assembly of catalytic converters whose types are indicated in point 1.10 of the Appendix to Annex X to this Directive but are offered on the market as separate technical units by the holder of the vehicle type-approval.]
- 2.20. ‘Family of vehicles’ means a group of vehicle types identified by a parent vehicle for the purpose of Annex XII.
- 2.21. ‘Fuel requirement by the engine’ means the type of fuel normally used by the engine:
- petrol,
 - LPG (liquefied petroleum gas),
 - NG (natural gas),
 - both petrol and LPG,
 - both petrol and NG,
 - diesel fuel.]

[^{F23}3. APPLICATION FOR EC TYPE-APPROVAL

- 3.1. The application for EC type-approval pursuant to Article 3 (4) of Directive 70/156/EEC of a vehicle type with regard to its tailpipe emissions, evaporative emissions, durability of anti-pollution devices as well as to its on-board diagnostic (OBD) system must be submitted by the vehicle manufacturer.

Should the application concern an on-board diagnostic (OBD) system the procedure described in Annex XI, section 3 must be followed.

- 3.1.1. Should the application concern an on-board diagnostic (OBD) system, it must be accompanied by the additional information required in section 3.2.12.2.8 of Annex II together with:
- 3.1.1.1. a declaration by the manufacturer of:
- 3.1.1.1.1. in the case of vehicles equipped with positive-ignition engines, the percentage of misfires out of a total number of firing events that would result in emissions exceeding the limits given in section 3.3.2 of Annex XI if that percentage of misfire had been present from the start of a type I test as described in section 5.3.1 of Annex III;
- 3.1.1.1.2. in the case of vehicles equipped with positive-ignition engines, the percentage of misfires out of a total number of firing events that could lead to an exhaust catalyst, or catalysts, overheating prior to causing irreversible damage;
- 3.1.1.2. detailed written information fully describing the functional operation characteristics of the OBD system, including a listing of all relevant parts of the vehicle's emission control system, i. e. sensors, actuators and components, that are monitored by the OBD system;
- 3.1.1.3. a description of the malfunction indicator (MI) used by the OBD system to signal the presence of a fault to a driver of the vehicle;

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- 3.1.1.4. the manufacturer must describe provisions taken to prevent tampering with and modification of the emission control computer;
- 3.1.1.5. when appropriate, copies of other type-approvals with the relevant data to enable extensions of approvals;
- 3.1.1.6. if applicable, the particulars of the vehicle family as referred to in Annex XI, Appendix 2.
- 3.1.2. For the tests described in section 3 of Annex XI, a vehicle representative of the vehicle type or vehicle family fitted with the OBD system to be approved must be submitted to the technical service responsible for the type-approval test. If the technical service determines that the submitted vehicle does not fully represent the vehicle type or vehicle family described in Annex XI, Appendix 2, an alternative and if necessary an additional vehicle must be submitted for test in accordance with section 3 of Annex XI.
- [^{F3}3.2. A model of the information document relating to tailpipe emissions, evaporative emissions, durability and the on-board diagnostic (OBD) system is given in Annex II. The information listed under section 3.2.12.2.8.6 of Annex II is to be included in Appendix 2 'OBD related information' to the EC type-approval certificate given in Annex X.]
- 3.2.1. Where appropriate, copies of other type-approvals with the relevant data to enable extension of approvals and establishment of deterioration factors must be submitted.]
- 3.3. For the tests described in Section 5 of this Annex a vehicle representative of the vehicle type to be approved must be submitted to the technical service responsible for the type-approval tests.
- [^{F2}4. GRANTING OF EC TYPE-APPROVAL
- 4.1. If the relevant requirements are satisfied, EC type-approval is granted pursuant to Article 4 (3) of Directive 70/156/EEC.
- 4.2. A model of the EC type-approval certificate relating to tailpipe emissions, evaporative emissions, durability and the on-board diagnostic (OBD) system is given in Annex X.]
- [^{F7}4.3. An approval number in accordance with Annex VII to Directive 70/156/EEC shall be assigned to each type of vehicle approved. The same Member State shall not assign the same number to another type of vehicle.]

Textual Amendments

- F7** Inserted by [Commission Directive 96/44/EC of 1 July 1996 adapting to technical progress Council Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\).](#)

5. REQUIREMENTS AND TESTS

[^{F2}Note:

As an alternative to the requirements of this section, vehicle manufacturers whose world-wide annual production is less than 10 000 units may obtain EC type-approval on the basis of the corresponding technical requirements in:

- the California Code of Regulations, Title 13, Sections 1960.1 (f) (2) or (g) (1) and (g) (2), 1960.1 (p) applicable to 1996 and later model year vehicles, 1968.1, 1976

and 1975, applicable to 1995 and later model year light-duty vehicles, published by Barclay's Publishing.

The type-approval authority must inform the Commission of the circumstances of each approval granted under this provision.]

5.1. General

5.1.1. The components liable to effect tailpipe and evaporative emissions must be so designed, constructed and assembled as to enable the vehicle, in normal use, to comply with the requirements of this Directive, despite the vibration to which they may be subjected.

[^{F2}The technical measures taken by the manufacturer must be such as to ensure that the tailpipe and evaporative emissions are effectively limited, pursuant to this Directive, throughout the normal life of the vehicle and under normal conditions of use. This will include the security of those hoses and their joints and connections, used within the emission control systems, which must be so constructed as to conform with the original design intent.

For tailpipe emissions, these provisions are deemed to be met if the provisions of sections 5.3.1.4 (type-approval) and section 7 (conformity of production and in-service vehicles) respectively are complied with.

For evaporative emissions, these provisions are deemed to be met if the provisions of section 5.3.4 (type-approval) and section 7 (conformity of production) are complied with.]

[^{F2}The use of a defeat device is prohibited.]

[^{F4}5.1.2. Inlet orifices of petrol tanks:]

5.1.2.1. Subject to 5.1.2.2, the inlet orifice of the fuel tank must be so designed that it prevents the tank from being filled from a petrol pump delivery nozzle which has an external diameter of 23,6 mm or greater.

5.1.2.2. Section 5.1.2.1 does not apply to a vehicle in respect of which both of the following conditions are satisfied, that is to say:

5.1.2.2.1. that the vehicle is so designed and constructed that no device designed to control the emission of gaseous pollutants is adversely affected by leaded petrol, and

5.1.2.2.2. that the vehicle is conspicuously, legibly and indelibly marked with the symbol for unleaded petrol specified in ISO 2575-1982 in a position immediately visible to a person filling the fuel tank. Additional markings are permitted.

[^{F5}5.1.3. Provision must be made to prevent excess evaporative emissions and fuel spillage caused by a missing fuel filler cap. This may be achieved by using one of the following:

- an automatically opening and closing, non-removable fuel filler cap,
- design features which avoid excess evaporative emissions in the case of a missing fuel filler cap,
- any other provision which has the same effect. Examples may include, but are not limited to, a tethered filler cap, a chained filler cap or one utilizing the same locking key for the filler cap as for the vehicle's ignition. In this case the key must be removable from the filler cap only in the locked condition.]

[^{F5}5.1.4. Provisions for electronic system security

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[^{F8}5.1.4.1] Any vehicle with an emission control computer must include features to deter modification, except as authorised by the manufacturer. The manufacturer shall authorise modifications if these modifications are necessary for the diagnosis, servicing, inspection, retrofitting or repair of the vehicle. Any reprogrammable computer codes or operating parameters must be resistant to tampering and afford a level of protection at least as good as the provisions in ISO DIS 15031-7; dated October 1998 (SAE J2186 dated October 1996) provided that the security exchange is conducted using the protocols and diagnostic connector as prescribed in Section 6.5 of Annex XI, Appendix 1. Any removable calibration memory chips must be potted, encased in a sealed container or protected by electronic algorithms and must not be changeable without the use of specialised tools and procedures.]

Textual Amendments

F8 Substituted by [Commission Directive 1999/102/EC of 15 December 1999 adapting to technical progress Council Directive 70/220/EEC relating to measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\)](#).

- 5.1.4.2. Computer-coded engine operating parameters must not be changeable without the use of specialized tools and procedures (e. g. soldered or potted computer components or sealed (or soldered) computer enclosures).
- 5.1.4.3. In the case of mechanical fuel-injection pumps fitted to compression-ignition engines, manufacturers must take adequate steps to protect the maximum fuel delivery setting from tampering while a vehicle is in service.
- 5.1.4.4. Manufacturers may apply to the approval authority for an exemption to one of these requirements for those vehicles which are unlikely to require protection. The criteria that the approval authority will evaluate in considering an exemption will include, but are not limited to, the current availability of performance chips, the high-performance capability of the vehicle and the projected sales volume of the vehicle.

[^{F8}5.1.4.5] Manufacturers using programmable computer code systems (e.g. electrical erasable programmable read-only memory, EEPROM) must deter unauthorised reprogramming. Manufacturers must include enhanced tamper-protection strategies and write protect features requiring electronic access to an off site computer maintained by the manufacturer. Methods giving an adequate level of tamper protection will be approved by the authority.]]

5.2. Application of tests

Figure 1.5.2 illustrates the routes for type-approval of a vehicle.

- [^{F2}5.2.1. Positive-ignition engined vehicles must be subject to the following tests:
- Type I (verifying the average tailpipe emissions after a cold start),
 - Type II (carbon monoxide emission at idling speed),
 - Type III (emission of crankcase gases),
 - Type IV (evaporation emissions),
 - Type V (durability of anti-pollution control devices),
 - Type VI (verifying the average low ambient temperature carbon monoxide and hydrocarbon tailpipe emissions after a cold start,
 - OBD-test.]

^{F9}5.2.2.

Textual Amendments

- F9** Deleted by [Council Directive 93/59/EEC of 28 June 1993 amending Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles.](#)

[^{F3}5.2.2. Positive-ignition engine powered vehicle fuelled with LPG or NG (mono or bi-fuel) shall be subjected to the following tests:

Type I (verifying the average tailpipe emissions after a cold start),

Type II (carbon monoxide emissions at idling speed),

Type III (emission of crankcase gases),

Type IV (evaporative emissions), where applicable,

Type V (durability of pollution control devices),

Type VI (verifying the average low ambient temperature carbon monoxide and hydrocarbon tailpipe emissions after a cold start), where applicable,

OBD test, where applicable.]

[^{F2}5.2.3. Compression-ignition engined vehicles must be subject to the following tests:

— Type I (verifying the average tailpipe emissions after a cold start)

— Type V (durability of anti-pollution control devices)

— and, where applicable, OBD test.]

^{F9}5.2.4.

5.3. Description of tests

5.3.1. Type I test (simulating the average tailpipe emissions after a cold start).

5.3.1.1. Figure I.5.3 illustrates the routes for type I test. This test must be carried out on all vehicles referred to in section 1, of a maximum mass not exceeding 3,5 tonnes.

5.3.1.2. The vehicle is placed on a chassis dynamometer equipped with a means of load and inertia simulation.

[^{F10}5.3.1.2] A test lasting a total of] vehicles referred to in 8.1, a test lasting a total of 19 minutes and 40 seconds, made up of two parts, One and Two, is performed without interruption. An unsampled period of not more than 20 seconds may, with the agreement of the manufacturer, be introduced between the end of Part One and the beginning of Part Two in order to facilitate adjustment of the test equipment.

[^{F6}5.3.1.2] Vehicles that are fuelled with LPG or NG shall be tested in the type I test for variations in the composition of LPG or NG, as set out in Annex XII. Vehicles that can be fuelled either with petrol or with LPG or NG shall be tested in the type I test on both fuels, of which the fuelling on LPG or NG has to be performed for variation in the composition of LPG or NG, as set out in Annex XII.

5.3.1.2.1. Notwithstanding the requirement of point 5.3.1.2.1.1, vehicles that can be fuelled with both petrol and a gaseous fuel, but where the petrol system is fitted for emergency purposes or starting only and of which the petrol tank cannot contain more than 15

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litres of petrol will be regarded for the test type I as vehicles that can only run on a gaseous fuel.]

Textual Amendments

F10 Substituted by [Council Directive 93/59/EEC of 28 June 1993 amending Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles.](#)

5.3.1.2.2. Part One of the test is made up of four elementary urban cycles. Each elementary urban cycle comprises fifteen phases (idling, acceleration, steady speed, deceleration, etc.).

5.3.1.2.3. Part Two of the test is made up of one extra urban cycle. The extra urban cycle comprises 13 phases (idling, acceleration, steady speed, deceleration, etc.).

[^{F2}FIGURE I.5.2

Different routes for type-approval and extensions

[^{F3} Type-approval test	Positive-ignition engined vehicles of categories M and N			Compression-ignition engined vehicles of categories M ₁ and N ₁
	Petrol-fuelled vehicle	Bi-fuel vehicle	Mono-fuel vehicle	
Type I	Yes (maximum mass ≤ 3,5 t)	Yes (test with both fuel types) (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)
Type II	Yes	Yes (test with both fuel types)	Yes	—
Type III	Yes	Yes (test only with petrol)	Yes	—
Type IV	Yes (maximum mass ≤ 3,5 t)	Yes (test only with petrol) (maximum mass ≤ 3,5 t)	—	—
Type V	Yes (maximum mass ≤ 3,5 t)	Yes (test only with petrol) (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)
Type VI	Yes (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t) (test only with petrol)	—	—
Extension	Section 6	Section 6	Section 6	Section 6; M ₂ and N ₂ with a

a The Commission will study further the question of extending the type-approval test to vehicles in categories M₂ and N₂ with a reference mass not exceeding 2 840 kg and put forward proposals no later than 2004 in accordance with the procedure laid down in Article 13 of Directive 70/156/EEC, for measures to be applied in 2005.]

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				reference mass ≤ 2 840 kg ^a
On-board diagnostics	Yes, in accordance with section 8.1.1 or 8.4	Yes, in accordance with section 8.1.2 or 8.4	Yes, in accordance with section 8.1.2 or 8.4	Yes, in accordance with sections 8.2, 8.3 or 8.4]

a The Commission will study further the question of extending the type-approval test to vehicles in categories M₂ and N₂ with a reference mass not exceeding 2 840 kg and put forward proposals no later than 2004 in accordance with the procedure laid down in Article 13 of Directive 70/156/EEC, for measures to be applied in 2005.]

^{F9}5.3.1.2.4.

5.3.1.2.5. During the test the exhaust gases are diluted and a proportional sample collected in one or more bags. The exhaust gases of the vehicle tested are diluted, sampled and analyzed, following the procedure described below, and the total volume of the diluted exhaust is measured. Not only the carbon monoxide, hydrocarbon and nitrogen oxide emissions, but also the particulate pollutant emissions from vehicles equipped with compression-ignition engines are recorded.

5.3.1.3. The test is carried out using the procedure described in Annex III. The methods used to collect and analyse the gases and to remove and weigh the particulates must be as prescribed.

5.3.1.4. [^{F11}Subject to the requirements of 5.3.1.5 the test must be repeated three times.][^{F10}The results are multiplied by] the appropriate deterioration factors obtained from 5.3.5. The resulting masses of gaseous emissions and, in the case of vehicles equipped with compression-ignition engines, the mass of particulates obtained in each test must be less than the limits shown in the [^{F2}tables] below:

Textual Amendments

F11 Substituted by [Commission Directive 96/44/EC of 1 July 1996 adapting to technical progress Council Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\).](#)

[^{F5} CategoryClass	Reference mass (RM) (kg)	Limit values				Mass of particulates ^a (PM)
		Mass of carbon monoxide (CO)	Mass of hydrocarbons (HC)	Mass of nitrogen oxides (NO _x)	Combined mass of hydrocarbons and oxides of nitrogen (HC + NO _x)	
		L ₁ (g/km)	L ₂ (g/km)	L ₃ (g/km)	L ₂ + L ₃ (g/km)	L ₄ (g/km)

a For compression ignition engines.

b Except vehicles the maximum mass of which exceeds 2 500 kg.

c And those Category M vehicles which are specified in note 2.]

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				Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Diesel
A (2000)	M^b	—	all	2,3	0,64	0,2	—	0,15	0,5	—	0,56	0,05
	N₁^c	I	RW ≤ 1305	2,3	0,64	0,2	—	0,15	0,5	—	0,56	0,05
		II	1305 < RW ≤ 1760	4,17	0,8	0,25	—	0,18	0,65	—	0,72	0,07
III		1760 < RW	5,22	0,95	0,29	—	0,21	0,78	—	0,86	0,1	
B (2005)	M^b	—	all	1,0	0,5	0,1	—	0,08	0,25	—	0,3	0,025
	N₁^c	I	RW ≤ 1305	1,0	0,5	0,1	—	0,08	0,25	—	0,3	0,025
		II	1305 < RW ≤ 1760	1,81	0,63	0,13	—	0,1	0,33	—	0,39	0,04
III		1760 < RW	2,27	0,74	0,16	—	0,11	0,39	—	0,46	0,06	

a For compression ignition engines.

b Except vehicles the maximum mass of which exceeds 2 500 kg.

c And those Category M vehicles which are specified in note 2.]

[^{F12} Category/class of vehicle		Limit values					
Category	Class	Reference mass RW (kg)	Mass of carbon monoxide L ₁ (g/km)		Combined mass of hydrocarbons and oxides of nitrogen L ₂ (g/km)		Mass of particulates L ₃ (g/km)
			Petrol	Diesel	Petrol	Diesel ^a	

a Until 30 September 1999, for vehicles fitted with diesel engines of the direct injection type, the limit values L₂ and L₃

are the following:

		L ₂	L ₃
—	category M and N ₁ class I:	0,9	0,1
—	category N ₁ class II:	1,3	0,14
—	category N ₁ class III:	1,6	0,2

b Except:
 — vehicles designed to carry more than six occupants including the driver,
 — vehicles whose maximum mass exceed 2 500 kg.

c And those category M vehicles which are specified in footnote (2).]

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M ^b	—	all	2,2	1,0	0,5	0,7	0,08
N ₁ ^c	I	RW ≤ 1 250	2,2	1,0	0,5	0,7	0,08
	II	1 250 < RW ≤ 1 700	4,0	1,25	0,6	1,0	0,12
	III	1 700 < RW	5,0	1,5	0,7	1,2	0,17

a Until 30 September 1999, for vehicles fitted with diesel engines of the direct injection type, the limit values L₂ and L₃ are the following:

	L ₂	L ₃
— category M and N ₁ class I:	0,9	0,1
— category N ₁ class II:	1,3	0,14
— category N ₁ class III:	1,6	0,2

b Except:
 — vehicles designed to carry more than six occupants including the driver,
 — vehicles whose maximum mass exceed 2 500 kg.

c And those category M vehicles which are specified in footnote (2).]

Textual Amendments

F12 Substituted by [Directive 96/69/EC of the European Parliament and of the Council of 8 October 1996 amending Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles.](#)

5.3.1.4.1. Notwithstanding the requirements of 5.3.1.4, for each pollutant or combination of pollutants, one of the three resulting masses obtained may exceed, by not more than 10 %, the limit prescribed, provided the arithmetical mean of the three results is below the prescribed limit. Where the prescribed limits are exceeded for more than one pollutant it is immaterial whether this occurs in the same test or in different tests.

^{F13} 5.3.1.4.2.

Textual Amendments

F13 Deleted by [Commission Directive 96/44/EC of 1 July 1996 adapting to technical progress Council Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\).](#)

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[^{F6}5.3.1.4] When the tests are performed with gaseous fuels, the resulting mass of gaseous emissions shall be less than the limits for petrol-engined vehicles in the above table.]

5.3.1.5. The number of tests prescribed in 5.3.1.4 is reduced in the conditions hereinafter defined, where V_1 is the result of the first test and V_2 the result of the second test for each pollutant or for the combined emission of two pollutants subject to limitation.

5.3.1.5.1. Only one test is performed if the result obtained for each pollutant or for the combined emission of two pollutants subject to limitation, is less than or equal to 0,70 L (ie. $V_1 \leq 0,70$ L).

5.3.1.5.2. If the requirement of 5.3.1.5.1 is not satisfied, only two tests are performed if, for each pollutant or for the combined emission of two pollutants subject to limitation, the following requirements are met:

$V_1 \leq 0,85$ L and $V_1 + V_2 \leq 1,70$ L and $V_2 \leq L$.

5.3.2. Type II test (carbon monoxide emission test at idling speed)

[^{F10}5.3.2.] This test is carried out on vehicles powered by a positive-ignition engine to which the test specified in 5.3.1 does not apply.]

[^{F6}5.3.2.1] Vehicles which can be fuelled either with petrol or with LPG or NG shall be tested in the test type II on both fuels.

5.3.2.1.2. Notwithstanding the requirement of point 5.3.2.1.1 above, vehicles that can be fuelled with both petrol and a gaseous fuel, but where the petrol system is fitted for emergency purposes or starting only and of which the petrol tank cannot contain more than 15 litres of petrol will be regarded for the type II test as vehicles that can only run on a gaseous fuel.]

[^{F10}5.3.2.2] When tested in accordance with Annex IV, the carbon monoxide content by volume of the exhaust gases emitted with the engine idling must not exceed 3,5 % at the setting specified by the manufacturer and must not exceed 4,5 % within the range of adjustments specified in that Annex.]

5.3.3. Type III test (verifying emissions of crankcase gases)

5.3.3.1. This test must be carried out on all vehicles referred to in section 1 except those having compression-ignition engines.

[^{F6}5.3.3.1] Vehicles that can be fuelled either with petrol or with LPG or NG should be tested in the type III test on petrol only.

5.3.3.1.2. Notwithstanding the requirement of point 5.3.3.1.1, vehicles that can be fuelled with both petrol and a gaseous fuel, but where the petrol system is fitted for emergency purposes or starting only and of which the petrol tank cannot contain more than 15 litres of petrol will be regarded for the type III test as vehicles that can only run on a gaseous fuel.]

5.3.3.2. When tested in accordance with Annex V, the engine's crankcase ventilation system must not permit the emission of any of the crankcase gases into the atmosphere.

5.3.4. Type IV test (determination of evaporative emissions)

[^{F10}5.3.4.] This test must be carried out on all vehicles referred to in Section 1 except those vehicles [^{F4}having a compression-ignition engine, and the vehicles fuelled with LPG or NG.]

[^{F6}5.3.4.1.] Vehicles that can be fuelled either with petrol or with LPG or NG should be tested in the type IV test on petrol only.]]

5.3.4.2. When tested in accordance with Annex VI, evaporative emissions shall be less than 2 g/test.

[^{F5}5.3.5. Type VI test (verifying the average low ambient temperature carbon monoxide and hydrocarbon tailpipe emissions after a cold start)

[^{F14}5.3.5.] This test must be carried out on all vehicles of category M₁ and N₁ equipped with a positive-ignition engine except such vehicles that run only on a gaseous fuel (LPG or NG). Vehicles that can be fuelled with both petrol and a gaseous fuel, but where the petrol system is fitted for emergency purposes or starting only and of which the petrol tank cannot contain more than 15 litres of petrol will be regarded for the Type VI test as vehicles that can only run on a gaseous fuel.

Vehicles which can be fuelled with petrol and either LPG or NG shall be tested in the test Type VI on petrol only.

This section is applicable to new types of vehicles of category M₁ and category N₁, class I, except vehicles designed to carry more than six occupants and vehicles the maximum mass of which exceeds 2 500 kg⁽³⁾.

From 1 January 2003, this section is applicable to new types of vehicles of category N₁ classes II and III, new types of category M₁ vehicles designed to carry more than six occupants and new types of vehicles of category M₁ with a maximum mass greater than 2 500 kg but not exceeding 3 500 kg.]

Textual Amendments

F14 Substituted by [Directive 2001/100/EC of the European Parliament and of the Council of 7 December 2001 amending Council Directive 70/220/EEC on the approximation of the laws of the Member States on measures to be taken against air pollution by emissions from motor vehicles \(Text with EEA relevance\).](#)

5.3.5.1.1. The vehicle is placed on a chassis dynamometer equipped with a means of load and inertia simulation.

5.3.5.1.2. The test consists of the four elementary urban driving cycles of part one of the Type I test. The Part One test is described in Annex III, Appendix 1 and illustrated in figures III.1.1 and III.1.2 of the Appendix. The low ambient temperature test lasting a total of 780 seconds must be carried out without interruption and start at engine cranking.

5.3.5.1.3. The low ambient temperature test must be carried out at an ambient test temperature of 266 °K (-7 °C). Before the test is carried out the test vehicles must be conditioned in a uniform manner to ensure that the test results may be reproducible. The conditioning and other test procedures are carried out as described in Annex VII.

5.3.5.1.4. During the test the exhaust gases are diluted and a proportional sample collected. The exhaust gases of the vehicle tested are diluted, sampled and analysed, following the procedure described in Annex VII, and the total volume of the diluted exhaust

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is measured. The diluted exhaust gases are analysed for carbon monoxide and hydrocarbons.

5.3.5.2. Subject to the requirements in 5.3.5.2.2 and 5.3.5.3 the test must be performed three times. The resulting mass of carbon monoxide and hydrocarbon emission must be less than the limits shown in the table below:

[^{F14} Test temperature 266 K (– 7 °C)]			
Category	Class	Mass of carbon monoxide (CO)L ₁ (g/km)	Mass of hydrocarbons (HC)L ₂ (g/km)
M ₁ ^a	—	15	1,8
N ₁	I	15	1,8
N ₁ ^b	II	24	2,7
	III	30	3,2

a Except vehicles designed to carry more than six occupants and vehicles the maximum mass of which exceeds 2 500 kg.

b And those category M₁ vehicles which are specified in note 1.]

5.3.5.2.1. Notwithstanding the requirements of 5.3.5.2, for each pollutant, not more than one of the three results obtained may exceed the limit prescribed by not more than 10 %, provided the arithmetical mean value of the three results is below the prescribed limit. Where the prescribed limits are exceeded for more than one pollutant it is immaterial whether this occurs in the same test or in different tests.

5.3.5.2.2. The number of tests prescribed in 5.3.5.2 may, at the request of the manufacturer, be increased to 10 provided that the arithmetical mean of the first three results falls between 100 % to 110 % of the limit. In this case, the requirement after testing is only that the arithmetical mean of all 10 results must be less than the limit value.

5.3.5.3. The number of tests prescribed in 5.3.5.2 may be reduced according to 5.3.5.3.1 and 5.3.5.3.2.

5.3.5.3.1. Only one test is performed if the result obtained for each pollutant of the first test is less than or equal to 0,70 L.

5.3.5.3.2. If the requirement of 5.3.5.3.1 is not satisfied, only two tests are performed if for each pollutant the result of the first test is less than or equal to 0,85 L and the sum of the first two results is less than or equal to 1,70 L and the result of the second test is less than or equal to L.

($V_1 \leq 0,85$ L and $V_1 + V_2 \leq 1,70$ L and $V_2 \leq L$.)]

[^{F2}5.3.6.] Type V test (durability of anti-pollution devices)

[^{F10}[^{F2}5.3.6.] This test must be carried out on all vehicles referred to in Section 1 to which the test specified in 5.3.1 applies.] The test represents an ageing test of 80 000 kilometres driven in accordance with the programme described in Annex VII on a test track, on the road or on a chassis dynamometer.

[^{F6}[^{F2}5.3.6.] Vehicles that can be fuelled either with petrol or with LPG or NG should be tested in the type V test on petrol only.]

[^{F2}5.3.6.2] Notwithstanding the requirement of [^{F2}5.3.6.1] a manufacturer may choose to have the deterioration factors from the following table used as an alternative to testing to [^{F2}5.3.6.1.1].

[^{F2} Engine Category]	Deterioration factors				
	CO	HC	NO _x	HC + NO _x ^a	Particulates
Positive-ignition engines	1,2	1,2	1,2	—	—
Compression-ignition engines	1,1	—	1,0	1,0	1,2

a For compression-ignition engines.]

At the request of the manufacturer, the technical service may carry out the type I test before the type V test has been completed using the deterioration factors in the table above. On completion of the type V test, the technical service may then amend the type-approval results recorded in Annex IX by replacing the deterioration factors in the above table with those measured in the type V test.

[^{F2}5.3.6.3] Deterioration factors are determined using either the procedure in 5.3.6.1 or using the values in the table in 5.3.6.2. The deterioration factors are used to establish compliance with the requirements of 5.3.1.4.]

[^{F5}5.3.7. Emissions data required for roadworthiness testing

5.3.7.1. This requirement applies to all vehicles powered by a positive-ignition engine for which EC type-approval is sought in accordance with this Directive.

5.3.7.2. When tested in accordance with Annex IV (type II test) at normal idling speed:

- the carbon monoxide content by volume of the exhaust gases emitted must be recorded,
- the engine speed during the test must be recorded, including any tolerances.

5.3.7.3. When tested at 'high idle' speed (i. e. > 2 000 min⁻¹):

- the carbon monoxide content by volume of the exhaust gases emitted must be recorded,
- the Lambda value⁽⁴⁾ must be recorded.
- the engine speed during the test must be recorded, including any tolerances.

5.3.7.4. The engine oil temperature at the time of the test must be measured and recorded.

5.3.7.5. The table in section 1.9 of the Appendix to Annex X must be completed.

5.3.7.6. The manufacturer must confirm the accuracy of the Lambda value recorded at the time of type-approval in section 5.3.7.3 as being representative of typical production vehicles within 24 months of the date of the granting of type-approval by the technical service. An assessment must be made on the basis of surveys and studies of production vehicles.]

[^{F3}5.3.8. Replacement catalytic converters and original replacement catalytic converters

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5.3.8.1. Replacement catalytic converters intended to be fitted to EC type-approved vehicles must be tested in accordance with Annex XIII.

5.3.8.2. Original replacement catalytic converters, which are of a type covered by point 1.10 of the Appendix to Annex X and are intended for fitment to a vehicle to which the relevant type-approval document refers, do not need to comply with Annex XIII to this Directive provided they fulfil the requirements of sections 5.3.8.2.1 and 5.3.8.2.2.

5.3.8.2.1. Marking

Original replacement catalytic converters shall bear at least the following identifications:

5.3.8.2.1.1. the vehicle manufacturer's name or trade mark;

5.3.8.2.1.2. the make and identifying part number of the original replacement catalytic converter as recorded in the information mentioned in point 5.3.8.3.

5.3.8.2.2. Documentation

Original replacement catalytic converters shall be accompanied by the following information:

5.3.8.2.2.1. the vehicle manufacturer's name or trade mark;

5.3.8.2.2.2. make and identifying part number of the original replacement catalytic converter as recorded in the information mentioned in point 5.3.8.3;

5.3.8.2.2.3. the vehicles for which the original replacement catalytic converter is of a type covered by point 1.10 of the Appendix to Annex X, including, where applicable, a marking to identify if the original replacement catalytic converter is suitable for fitting to a vehicle that is equipped with an on-board diagnostic (OBD) system;

5.3.8.2.2.4. installation instructions, where necessary;

5.3.8.2.2.5. this information shall be provided either:

- as a leaflet accompanying the original replacement catalytic converter, or
- on the packaging in which the original replacement catalytic converter is sold, or
- or by any other applicable means.

In any case, the information must be available in the product catalogue distributed to points of sale by the vehicle manufacturer.

5.3.8.3. The vehicle manufacturer shall provide to the technical service and/or approval authority the necessary information in electronic format which makes the link between the relevant part numbers and the type approval documentation.

This information shall contain:

- make(s) and type(s) of vehicle,
- make(s) and type(s) of original replacement catalytic converter,
- part number(s) of original replacement catalytic converter,
- type-approval number of the relevant vehicle type(s).]

[^{F11}6. MODIFICATIONS OF THE TYPE AND AMENDMENTS TO APPROVALS

In the case of modifications of the type approved pursuant to this Directive, the provisions of Article 5 of Directive 70/156/EEC and, if applicable, the following special provisions shall apply:]

[^{F2}6.1. Tailpipe emission related extension (type I, type II and type VI tests)]

[^{F10}6.1.1. Vehicle types of different reference masses

[^{F11}6.1.1.1. Approval granted to a vehicle type may be extended only to vehicle types of a reference mass requiring the use of the next two higher equivalent inertia or any lower equivalent inertia.]

6.1.1.2. In the case of vehicles of category N₁ and vehicles of category M referred to in note 2 of Section 5.3.1.4, if the reference mass of the vehicle type for which extension of the approval is requested requires the use of a flywheel of equivalent inertia lower than that used for the vehicle type already approved, extension of the approval is granted if the masses of the pollutants obtained from the vehicle already approved are within the limits prescribed for the vehicle for which extension of the approval is requested]

6.1.2. Vehicle types with different overall gear ratios

Approval granted to a vehicle type may under the following conditions be extended to vehicle types which differ from the type approved only in respect of their transmission ratios:

[^{F2}6.1.2.1. For each of the transmission ratios used in the type I and type VI tests,] it is necessary to determine the proportion,

$$E = \frac{V_2 - V_1}{V_1}$$

where, at an engine speed of 1 000 rpm, V₁ is the speed of the vehicle-type approved and V₂ is the speed of the vehicle type for which extension of the approval is requested.

[^{F2}6.1.2.2. If, for each gear ratio, E ≤ 8 %, the extension is granted without repeating the type I and type VI tests.

6.1.2.3. If, for at least one gear ratio, E ≤ 8 %, and if, for each gear ratio, E ≤ 13 %, the type I and type VI tests must be repeated,] but may be performed in a laboratory chosen by the manufacturer [^{F11}subject to the approval of the technical service.] The report of the tests must be sent to the technical service responsible for the type-approval tests.

6.1.3. Vehicle types of different reference masses and different overall transmission ratios

Approval granted to a vehicle type may be extended to vehicle types differing from the approved type only in respect of their reference mass and their overall transmission ratios, provided that all the conditions prescribed in 6.1.1 and 6.1.2 are fulfilled.

6.1.4. Note:

When a vehicle type has been approved in accordance with 6.1.1 to 6.1.3, such approval may not be extended to other vehicle types.

6.2. Evaporative emissions (type IV test)

6.2.1. Approval granted to a vehicle type equipped with a control system for evaporative emissions may be extended under the following conditions:

6.2.1.1. The basic principle of fuel/air metering (e.g. single point injection, carburettor) must be the same.

6.2.1.2. The shape of the fuel tank and the material of the fuel tank and liquid fuel hoses must be identical. The worst-case family with regard to the cross-section and approximate hose

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length must be tested. Whether non-identical vapour/liquid separators are acceptable is decided by the technical service responsible for the type-approval tests. The fuel tank volume must be within a range of $\pm 10\%$. The setting of the tank relief valve must be identical.

6.2.1.3. The method of storage of the fuel vapour must be identical, i.e. trap form and volume, storage medium, air cleaner (if used for evaporative emission control), etc.

6.2.1.4. The carburettor bowl fuel volume must be within a 10 millilitre range.

6.2.1.5. The method of purging of the stored vapour must be identical (e.g. air flow, start point or purge volume over driving cycle).

6.2.1.6. The method of sealing and venting of the fuel metering system must be identical.

6.2.2. Further notes:

- (i) different engine sizes are allowed;
- (ii) different engine powers are allowed;
- (iii) automatic and manual gearboxes, two and four wheel transmissions are allowed;
- (iv) different body styles are allowed;
- (v) different wheel and tyre sizes are allowed.

6.3. Durability of anti-pollution devices
(type V test)

6.3.1. Approval granted to a vehicle type may be extended to different vehicle types, provided that the engine/pollution control system combination is identical to that of the vehicle already approved. To this end, those vehicle types whose parameters described below are identical or remain within the limit values prescribed are considered to belong to the same engine/pollution control system combination.

6.3.1.1. Engine:

- number of cylinders,
- engine capacity ($\pm 15\%$),
- configuration of the cylinder block,
- number of valves,
- fuel system,
- type of cooling system,
- combustion process^[F11],
- ^[F7]cylinder bore centre to centre dimensions.]

6.3.1.2. Pollution control system:

- Catalytic converters:
 - number of catalytic converters and elements,
 - ^[F11]size and shape of catalytic converters (volume of monolith $\pm 10\%$),]
 - type of catalytic activity (oxidizing, three-way, ...),
 - precious metal load (identical or higher),
 - precious metal ratio ($\pm 15\%$),
 - substrate (structure and material),

- cell density,
- type of casing for the catalytic converter(s),
- location of catalytic converters (position and dimension in the exhaust system, that does not produce a temperature variation of more than 50 K at the inlet of the catalytic converter).^[F7]This temperature variation shall be checked under stabilized conditions at a speed of 120 km/h and the load setting of type I test.]
- Air injection:
 - with or without
 - type (pulsair, air pumps, ...).
- EGR:
 - with or without.

^[F11]6.3.1.3 Inertia category: the two inertia categories immediately above and any inertia category below.]

6.3.1.4. The durability test may be achieved by using a vehicle, the body style, gear box (automatic or manual) and size of the wheels or tyres of which are different from those of the vehicle type for which the type approval is sought.

^[F5]6.4. On-board diagnostics

6.4.1. Approval granted to a vehicle type with respect to the OBD system may be extended to different vehicle types belonging to the same vehicle-OBD family as described in Annex XI, Appendix 2. The engine emission control system must be identical to that of the vehicle already approved and comply with the description of the OBD engine family given in Annex XI, Appendix 2, regardless of the following vehicle characteristics:

- engine accessories,
- tyres,
- equivalent inertia,
- cooling system,
- overall gear ratio,
- transmission type,
- type of bodywork.]

^[F15]7. CONFORMITY OF PRODUCTION

^[F2]7.1. Measures to ensure the conformity of production must be taken in accordance with the provisions of Article 10 of Directive 70/156/EEC, as last amended by Directive 96/27/EEC (whole vehicle type-approval). That Article entrusts the manufacturer with the responsibility for taking measures to ensure the conformity of production to the type approved. Conformity of production is checked on the basis of the description in the type-approval certificate set out in Annex X to this Directive.

As a general rule, conformity of production with regard to limitation of tailpipe and evaporative emissions from the vehicle is checked on the basis of the description in the type-approval certificate set out in Annex X and, where necessary, of all or some of the tests of types I, II, III and IV described in section 5.2.

Conformity of in-service vehicles

With reference to type-approvals granted for emissions, these measures must also be appropriate for confirming the functionality of the emission control devices during the normal useful life

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of the vehicles under normal conditions of use (conformity of in-service vehicles properly maintained and used). For the purpose of this Directive these measures must be checked for a period of up to 5 years of age or 80 000 km, whichever is the sooner, and from 1 January 2005, for a period of up to five years of age or 100 000 km, whichever is the sooner.

[^{F3}7.1.1. Audit of in-service conformity by the type-approval authority is conducted on the basis of any relevant information that the manufacturer has, under procedures similar to those defined in Article 10(1) and (2) of Directive 70/156/EEC and in points 1 and 2 of Annex X to that Directive.

Figures I.8 and I.9 in Appendix 4 to this Annex illustrate the procedure for in-service conformity checking.

7.1.1.1. Parameters defining the in-service family

The in-service family may be defined by basic design parameters which must be common to vehicles within the family. Accordingly, those vehicle types which have in common, or within the stated tolerances, at least the parameters described below, can be considered as belonging to the same in-service family:

- combustion process (2-stroke, 4-stroke, rotary),
- number of cylinders,
- configuration of the cylinder block (in-line, V, radial, horizontally opposed, other). The inclination or orientation of the cylinders is not a criteria),
- method of engine fuelling (e.g. indirect or direct injection),
- type of cooling system (air, water, oil),
- method of aspiration (naturally aspirated, pressure charged),
- fuel for which the engine is designed (petrol, diesel, NG, LPG, etc). Bi-fuelled vehicles may be grouped with dedicated fuel vehicles providing one of the fuels is common,
- type of catalytic converter (three-way catalyst or other(s)),
- type of particulate trap (with or without),
- exhaust gas recirculation (with or without),
- engine cylinder capacity of the largest engine within the family minus 30 %.

7.1.1.2. An audit of in-service conformity will be conducted by the type-approval authority on the basis of information supplied by the manufacturer. Such information must include, but is not limited to, the following:

7.1.1.2.1. the name and address of the manufacturer;

7.1.1.2.2. the name, address, telephone and fax numbers and e-mail address of his authorised representative within the areas covered by the manufacturer's information;

7.1.1.2.3. the model name(s) of the vehicles included in the manufacturer's information;

7.1.1.2.4. where appropriate, the list of vehicle types covered within the manufacturer's information, i.e. the in-service family group in accordance with section 7.1.1.1;

7.1.1.2.5. the vehicle identification number (VIN) codes applicable to these vehicle types within the in-service family (VIN prefix);

7.1.1.2.6. the numbers of the type approvals applicable to these vehicle types within the in-service family, including, where applicable, the numbers of all extensions and field fixes/recalls (re-works);

- 7.1.1.2.7. details of extensions, field fixes/recalls to those type approvals for the vehicles covered within the manufacturer's information (if requested by the type-approval authority);
- 7.1.1.2.8. the period of time over which the manufacturer's information was collected;
- 7.1.1.2.9. the vehicle build period covered within the manufacturer's information (e.g. vehicles manufactured during the 2001 calendar year);
- 7.1.1.2.10. the manufacturer's in-service conformity checking procedure, including:
- 7.1.1.2.10.1. vehicle location method;
- 7.1.1.2.10.2. vehicle selection and rejection criteria;
- 7.1.1.2.10.3. test types and procedures used for the programme;
- 7.1.1.2.10.4. the manufacturer's acceptance/rejection criteria for the in-service family group;
- 7.1.1.2.10.5. geographical area(s) within which the manufacturer has collected information;
- 7.1.1.2.10.6. sample size and sampling plan used;
- 7.1.1.2.11. the results from the manufacturer's in-service conformity procedure, including:
- 7.1.1.2.11.1. identification of the vehicles included in the programme (whether tested or not). The identification will include:
- model name,
 - vehicle identification number (VIN),
 - vehicle registration number,
 - date of manufacture,
 - region of use (where known),
 - tyres fitted;
- 7.1.1.2.11.2. the reason(s) for rejecting a vehicle from the sample;
- 7.1.1.2.11.3. service history for each vehicle in the sample (including any re-works);
- 7.1.1.2.11.4. repair history for each vehicle in the sample (where known);
- 7.1.1.2.11.5. test data, including:
- date of test,
 - location of test,
 - distance indicated on vehicle odometer,
 - test fuel specifications (e.g. test reference fuel or market fuel),
 - test conditions (temperature, humidity, dynamometer inertia weight),
 - dynamometer settings (e.g. power setting),
 - test results (from at least three different vehicles per family);
- 7.1.1.2.12. records of indication from the OBD system.]

[^{F3}7.1.2. The information gathered by the manufacturer must be sufficiently comprehensive to ensure that in-service performance can be assessed for normal conditions of use as defined in section 7.1 and in a way representative of the manufacturer's geographic penetration.

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For the purpose of this Directive, the manufacturer shall not be obliged to carry out an audit of in-service conformity for a vehicle type if he can demonstrate to the satisfaction of the type-approval authority that the annual sales of that vehicle type are less than 5 000 per annum in the Community.]]

[^{F11}[^{F27.1.3.1}]] If a type I test is to be carried out and a vehicle type-approval has one or several extensions, the tests will be carried out either on the vehicle described in the initial information package or on the vehicle described in the information package relating to the relevant extension.]

[^{F27.1.3.1}] Checking the conformity of the vehicle for a type I test.

After selection by the authority, the manufacturer must not undertake any adjustment to the vehicles selected.

[^{F27.1.3.1}] Three vehicles are selected at random in the series and are tested as described in Section 5.3.1 of this Annex. The deterioration factors are used in the same way. The limit values are given in Section 5.3.1.4 of this Annex.

[^{F27.1.3.1}] If the authority is satisfied with the production standard deviation given by the manufacturer in accordance with Annex X to Directive 70/156/EEC, the tests are carried out according to Appendix 1 of this Annex.

If the authority is not satisfied with the production standard deviation given by the manufacturer in accordance with Annex X to Directive 70/156/EEC, the tests are carried out according to Appendix 2 of this Annex.

[^{F27.1.3.1}] The production of a series is deemed to conform or not to conform on the basis of a sampling test of the vehicles once a pass decision is reached for all the pollutants or a fail decision is reached for one pollutant, according to the test criteria applied in the appropriate appendix.

When a pass decision has been reached for one pollutant, that decision will not be changed by any additional tests carried out to reach a decision for the other pollutants.

If no pass decision is reached for all the pollutants and no fail decision is reached for one pollutant, a test is carried out on another vehicle (see Figure I/7).

[^{F27.1.3.2}] Notwithstanding the requirements of Section 3.1.1 of Annex III, the tests will be carried out on vehicles coming straight off the production line.

[^{F27.1.3.2}] However, at the request of the manufacturer, the tests may be carried out on vehicles which have completed:

- a maximum of 3 000 km for vehicles equipped with a positive ignition engine,
- a maximum of 15 000 km for vehicles equipped with a compression ignition engine,

In both these cases, the running-in procedure will be conducted by the manufacturer, who must undertake not to make any adjustments to these vehicles.

[^{F27.1.3.2}] If the manufacturer wishes to run in the vehicles, ('x' km, where $x \leq 3\ 000$ km for vehicles equipped with a positive ignition engine and $x \leq 15\ 000$ km for vehicles equipped with a compression ignition engine), the procedure will be as follows:

- the pollutant emissions (type I) will be measured at zero and at 'x' km on the first tested vehicle,

- the evolution coefficient of the emissions between zero and ‘x’ km will be calculated for each of the pollutants:

$$\frac{\text{Emissions at } x \text{ km}}{\text{Emissions at } 0 \text{ km}}$$

This may be less than 1,

- the other vehicles will not be run in, but their zero km emissions will be multiplied by the evolution coefficient.

In this case, the values to be taken will be:

- the values at ‘x’ km for the first vehicle,
- the values at zero km multiplied by the evolution coefficient for the other vehicles.

[F27.1.3.2.A] these tests may be conducted with commercial fuel. However, at the manufacturer's request, the reference fuels described in Annex VIII may be used.

[F27.1.4.] If a type III test is to be carried out, it must be conducted on all vehicles selected for the type I COP test (7.1.1.1.1). The conditions laid down in 5.3.3.2 must be complied with.

[F27.1.5.] If a type IV test is to be carried out, it must be conducted in accordance with Section 7 of Annex VI.

[F5] On-board Diagnostics (OBD)

7.1.6. If a verification of the performance of the OBD system is to be carried out, it must be conducted in accordance with the following:

7.1.6.1. When the approval authority determines that the quality of production seems unsatisfactory a vehicle is randomly taken from the series and subjected to the tests described in Annex XI, Appendix 1.

7.1.6.2. The production is deemed to conform if this vehicle meets the requirements of the tests described in Annex XI, Appendix 1.

7.1.6.3. If the vehicle taken from the series does not satisfy the requirements of section 7.1.6.1 a further random sample of four vehicles must be taken from the series and subjected to the tests described in Annex XI, Appendix 1. The tests may be carried out on vehicles which have been run in for no more than 15 000 km.

7.1.6.4. The production is deemed to conform if at least 3 vehicles meet the requirements of the tests described in Annex XI, Appendix 1.]

[F5][F3] 7.1.7. On the basis of the audit referred to in section 7.1.1, the type-approval authority must either:

- decide that the in-service conformity of a vehicle type or a vehicle in-service family is satisfactory and not take any further action,
- decide that the data provided by the manufacturer is insufficient to reach a decision and request additional information or test data from the manufacturer, or
- decide that the in-service conformity of a vehicle type, or vehicle type(s) that is/are part of an in-service family, is unsatisfactory and proceed to have such vehicle type(s) tested in accordance with Appendix 3 to this Annex.

In the case that the manufacturer has been permitted to not carry out an audit for a particular vehicle type in accordance with section 7.1.2, the type-approval authority may proceed to have such vehicle types tested in accordance with Appendix 3 to this Annex.]

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- 7.1.7.1. Where type I tests are considered necessary to check the conformity of emission control devices with the requirements for their performance while in service, such tests must be carried out using a test procedure meeting the statistical criteria defined in Appendix 4 to this Annex.
- 7.1.7.2. The type-approval authority, in cooperation with the manufacturer, must select a sample of vehicles with sufficient mileage whose use under normal conditions can be reasonably assured. The manufacturer must be consulted on the choice of the vehicles in the sample and be allowed to attend the confirmatory checks of the vehicles.
- 7.1.7.3. The manufacturer is authorized, under the supervision of the type-approval authority, to carry out checks, even of a destructive nature, on those vehicles with emission levels in excess of the limit values with a view to establishing possible causes of deterioration which cannot be attributed to the manufacturer himself (e. g. use of leaded petrol before the test date). Where the results of the checks confirm such causes, those test results are excluded from the conformity check.
- 7.1.7.4. Where the type-approval authority is not satisfied with the results of the tests in accordance with the criteria defined in Appendix 4, the remedial measures referred to in Article 11 (2) and in Annex X to Directive 70/156/EEC are extended to vehicles in service belonging to the same vehicle type which are likely to be affected with the same defects in accordance with section 6 of Appendix 3.

The plan of remedial measures presented by the manufacturer must be approved by the type-approval authority. The manufacturer is responsible for the execution of the remedial plan as approved.

The type-approval authority must notify its decision to all Member States within 30 days. The Member States may require the same plan of remedial measures be applied to all vehicles of the same type registered in their territory.

- 7.1.7.5. If a Member State has established that a vehicle type does not conform to the applicable requirements of Appendix 3 to this Annex, it must notify without delay the Member State which granted the original type-approval in accordance with the requirements of Article 11 (3) of Directive 70/156/EEC.

Then, subject to the provision of Article 11(6) of Directive 70/156/EEC, the competent authority of the Member State which granted the original type-approval shall inform the manufacturer that a vehicle type fails to satisfy the requirements of these provisions and that certain measures are expected of the manufacturer. The manufacturer shall submit to the authority, within two months after this notification, a plan of measures to overcome the defects, the substance of which should correspond to the requirements of sections 6.1 to 6.8 of Appendix 3. The competent authority which granted the original type-approval shall, within two months, consult the manufacturer in order to secure agreement on a plan of measures and on carrying out the plan. If the competent authority which granted the original type-approval establishes that no agreement can be reached, the procedure pursuant to Article 11(3) and (4) of Directive 70/156/EEC shall be initiated.]]

Textual Amendments

F15 Substituted by [Directive 94/12/EC of the European Parliament and the Council of 23 March 1994 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Directive 70/220/EEC](#).

- 8.1.
- 8.2.
- 8.3.

Textual Amendments

- F16** Deleted by [Directive 98/69/EC of the European Parliament and of the Council of 13 October 1998 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC](#).

[^{F58} ON-BOARD DIAGNOSTIC (OBD) SYSTEM FOR MOTOR VEHICLES

[^{F8}[^{F17}8.1. Vehicles with positive-ignition engines

8.1.1. Petrol fuelled engines

With effect from 1 January 2000 for new types and from 1 January 2001 for all types, vehicles of category M1 — except vehicles the maximum mass of which exceeds 2 500 kg — and vehicles of category N1 class I, must be fitted with an OBD system for emission control in accordance with Annex XI.

With effect from 1 January 2001 for new types and from 1 January 2002 for all types, vehicles of category N1 classes II and III and vehicles of category M1, the maximum mass of which exceeds 2 500 kg, must be fitted with an OBD system for emission control in accordance with Annex XI.

8.1.2. LPG and natural gas fuelled vehicles

With effect from 1 January 2003 for new types and from 1 January 2004 for all types, vehicles of category M1 — except vehicles the maximum mass of which exceeds 2 500 kg — and vehicles of category N1 class I, running permanently or part-time on either LPG or natural gas fuel, must be fitted with an OBD system for emission control in accordance with Annex XI.

With effect from 1 January 2006 for new types and from 1 January 2007 for all types, vehicles of category N1 classes II and III and vehicles of category M1, the maximum mass of which exceeds 2 500 kg, running permanently or part-time on either LPG or natural gas fuel, must be fitted with an OBD system for emission control in accordance with Annex XI.]

Textual Amendments

- F17** Substituted by [Directive 2001/1/EC of the European Parliament and of the Council of 22 January 2001 amending Council Directive 70/220/EEC concerning measures to be taken against air pollution by emissions from motor vehicles](#).

8.2. Vehicles with compression-ignition engines

Vehicles of category M₁, except

- vehicles designed to carry more than six occupants including the driver,
- vehicles whose maximum mass exceeds 2 500 kg,

from 1 January 2003 for new types and from 1 January 2004 for all types, must be fitted with an on-board diagnostic (OBD) system for emission control in accordance with Annex XI.

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Where new types of compression-ignition engines entering into service prior to this date are fitted with an OBD system, the provisions of sections 6.5.3 to 6.5.3.6 of Annex XI, Appendix 1, are applicable.

8.3. Vehicles with compression-ignition engines exempt from Section 8.2

From 1 January 2005 for new types and from 1 January 2006 for all types, vehicles of category M₁ exempted by Section 8.2, except vehicles of category M₁ equipped with compression-ignition engines and the maximum mass of which exceeds 2 500 kg, and vehicles in category N₁ class 1 equipped with compression-ignition engines, must be fitted with on-board diagnostic (OBD) systems for emission control in accordance with Annex XI.

From 1 January 2006 for new types and 1 January 2007 for all types, vehicles in category N₁, classes II and III equipped with compression-ignition engines and vehicles of category M₁ equipped with compression-ignition engines and the maximum mass of which exceeds 2 500 kg, must be fitted with on-board diagnostic (OBD) systems for emission control in accordance with Annex XI.

Where compression-ignition engines entering into service prior to the dates given in this section are fitted with OBD systems, the provisions of Sections 6.5.3 to 6.5.3.6 of Annex XI, Appendix 1, are applicable.

8.4. Vehicles of other categories

Vehicles of other categories or vehicles of category M₁ and N₁ not covered by 8.1, 8.2 or 8.3, may be fitted with an OBD system. In this case, Sections 6.5.3 to 6.5.3.6 of Annex XI, Appendix 1 are applicable.]]

[^{F18}Appendix I

1. This Appendix describes the procedure to be used to verify the production conformity for the type I test when the manufacturer's production standard deviation is satisfactory.
2. With a minimum sample size of 3, the sampling procedure is set so that the probability of a lot passing a test with 40 % of the production defective is 0,95 (producer's risk = 5 %) while the probability of a lot being accepted with 65 % of the production defective is 0,1 (consumer's risk = 10 %).
3. For each of the pollutants given in Section 5.3.1.4 of Annex I, the following procedure is used (see Figure I.7).

Taking:

- L = the natural logarithm of the limit value for the pollutant,
 x_i = the natural logarithm of the measurement for the i -th vehicle of the sample,
 s = an estimate of the production standard deviation (after taking the natural logarithm of the measurements),
 n = the current sample number.

4. Compute for the sample the test statistic quantifying the sum of the standard deviations from the limit and defined as:

$$\sum_{i=1}^n (L - x_i)$$

5. Then:
 - if the test statistic is greater than the pass decision number for the sample size given in Table (I.1.5), the pollutant is passed,
 - if the test statistic is less than the fail decision number for the sample size given in Table (I.1.5), the pollutant is failed; otherwise, an additional vehicle is tested according to Section 7.1.1.1 of Annex I and the calculation reapplied to the sample with a sample size one unit greater.

TABLE I.1.5

Cumulative number of tested vehicles(current sample size)	Pass decision threshold	Fail decision threshold
3	3,327	-4,724
4	3,261	-4,79
5	3,195	-4,856
6	3,129	-4,922
7	3,063	-4,988
8	2,997	-5,054
9	2,931	-5,12
10	2,865	-5,185
11	2,799	-5,251

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12	2,733	-5,317
13	2,667	-5,383
14	2,601	-5,449
15	2,535	-5,515
16	2,469	-5,581
17	2,403	-5,647
18	2,337	-5,713
19	2,271	-5,779
20	2,205	-5,845
21	2,139	-5,911
22	2,073	-5,977
23	2,007	-6,043
24	1,941	-6,109
25	1,875	-6,175
26	1,809	-6,241
27	1,743	-6,307
28	1,677	-6,373
29	1,611	-6,439
30	1,545	-6,505
31	1,479	-6,571
32	-2,112	-2,112

Appendix 2

1. This Appendix describes the procedure to be used to verify the production conformity requirements for the type I test when the manufacturer's evidence of production standard deviation is either unsatisfactory or unavailable.
2. With a minimum sample size of 3, the sampling procedure is set so that the probability of a lot passing a test with 40 % of the production defective is 0,95 (producer's risk = 5 %) while the probability of a lot being accepted with 65 % of the production defective is 0,1 (consumer's risk = 10 %).
3. The measurements of the pollutants given in Section 5.3.1.4 of Annex I are considered to be log normally distributed and must first be transformed by taking their natural logarithms. Let m_0 and m denote the minimum and maximum sample sizes respectively ($m_0 = 3$ and $m = 32$) and let n denote the current sample number.
4. If the natural logarithms of the measurements in the series are x_1, x_2, \dots, x_j and L is the natural logarithm of the limit value for the pollutant, then define:

$$d_j = x_j - L$$

$$\hat{d}_n = \frac{1}{n} \sum_{j=1}^n d_j$$

$$v_n^2 = \frac{1}{n} \sum_{j=1}^n (d_j - \hat{d}_n)^2$$

5. Table I.2.5 shows values of the pass (A_n) and fail (B_n) decision numbers against current sample number. The test statistic is the ratio

$$\frac{\hat{d}_n}{v_n}$$

and must be used to determine whether the series has passed or failed as follows:

For $m_0 \leq n \leq m$:

— pass the series if

$$\frac{\hat{d}_n}{v_n} \leq A_n,$$

— fail the series if

$$\frac{\hat{d}_n}{v_n} \geq B_n,$$

— take another measurement if $A_n <$

$$\frac{\hat{d}_n}{v_n} < B_n.$$

6. Remarks

The following recursive formulae are useful for computing successive values of the test statistic:

$$\hat{d}_n = \left(1 - \frac{1}{n}\right) \hat{d}_{n-1} + \frac{1}{n} d_n$$

$$v_n^2 = \left(1 - \frac{1}{n}\right) v_{n-1}^2 + \frac{(d_n - \hat{d}_n)^2}{n-1}$$

($n = 2, 3, \dots; d_1 = d_1; v_1 = 0$)

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TABLE I.2.5

Minimum sample size = 3

Sample size_n	Pass decision thresholdA_n	Fail decision thresholdB_n
3	-0,80381	16,64743
4	-0,76339	7,68627
5	-0,72982	4,67136
6	-0,69962	3,25573
7	-0,67129	2,45431
8	-0,64406	1,94369
9	-0,6175	1,59105
10	-0,59135	1,33295
11	-0,56542	1,13566
12	-0,5396	0,9797
13	-0,51379	0,85307
14	-0,48791	0,74801
15	-0,46191	0,65928
16	-0,43573	0,58321
17	-0,40933	0,51718
18	-0,38266	0,45922
19	-0,3557	0,40788
20	-0,3284	0,36203
21	-0,30072	0,32078
22	-0,27263	0,28343
23	-0,2441	0,24943
24	-0,21509	0,21831
25	-0,18557	0,1897
26	-0,1555	0,16328
27	-0,12483	0,1388
28	-0,09354	0,11603
29	-0,06159	0,0948
30	-0,02892	0,07493
31	0,00449	0,05629
32	0,03876	0,03876]

[^{F5}Appendix 3

IN-SERVICE CONFORMITY CHECK

1. INTRODUCTION

This Appendix sets out the criteria referred to in section 7.1.7 of this Annex regarding the selection of vehicles for testing and the procedures for the in-service conformity control.

2. SELECTION CRITERIA

The criteria for acceptance of a selected vehicle are defined in sections 2.1 to 2.8 of this Appendix. Information is collected by vehicle examination and an interview with the owner/driver.

- 2.1. The vehicle must belong to a vehicle type that is type-approved under this Directive and covered by a certificate of conformity in accordance with Directive 70/156/EEC. It must be registered and used in the European Community.
- 2.2. The vehicle must have been in service for at least 15 000 km or 6 months, whichever is the later, and for no more than 80 000 km or 5 years, whichever is the sooner.
- 2.3. There must be a maintenance record to show that the vehicle has been properly maintained, e. g. has been serviced in accordance with the manufacturer's recommendations.
- 2.4. The vehicle must exhibit no indications of abuse (e. g. racing, overloading, misfuelling, or other misuse), or other factors (e. g. tampering) that could affect emission performance. In the case of vehicles fitted with an OBD system, the fault code and mileage information stored in the computer are taken into account. A vehicle must not be selected for testing if the information stored in the computer shows that the vehicle has operated after a fault code was stored and a relatively prompt repair was not carried out.
- 2.5. There must have been no unauthorized major repair to the engine or major repair of the vehicle.
- [^{F3}2.6. The lead content and sulphur content of a fuel sample from the vehicle tank must meet the applicable standards laid down in Directive 98/70/EC⁽⁵⁾ and there must be no evidence of mis-fuelling. Checks may be done in the tailpipe etc.]
- 2.7. There must be no indication of any problem that might jeopardize the safety of laboratory personnel.
- 2.8. All anti-pollution system components on the vehicle must be in conformity with the applicable type-approval.

3. DIAGNOSIS AND MAINTENANCE

Diagnosis and any normal maintenance necessary must be performed on vehicles accepted for testing, prior to measuring exhaust emissions, in accordance with the procedure laid down in section 3.1 to 3.7.

- 3.1. The following checks must be carried out: checks on air filter, all drive belts, all fluid levels, radiator cap, all vacuum hoses and electrical wiring related to the antipollution

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system for integrity; checks on ignition, fuel metering and anti-pollution device components for maladjustments and/or tampering. All discrepancies must be recorded.

- 3.2. The OBD system shall be checked for proper functioning. Any malfunction indications in the OBD memory must be recorded and the requisite repairs must be carried out. If the OBD malfunction indicator registers a malfunction during a preconditioning cycle, the fault may be identified and repaired. The test may be re-run and the results of that repaired vehicle used.
- 3.3. The ignition system must be checked and defective components replaced, for example spark plugs, cables, etc.
- 3.4. The compression must be checked. If the result is unsatisfactory the vehicle is rejected.
- 3.5. The engine parameters must be checked to the manufacturer's specifications and adjusted if necessary.
- 3.6. If the vehicle is within 800 km of a scheduled maintenance service, that service must be performed according to the manufacturer's instructions. Regardless of odometer reading, the oil and air filter may be changed at the request of the manufacturer.
- 3.7. Upon acceptance of the vehicle, the fuel must be replaced with appropriate emission test reference fuel, unless the manufacturer accepts the use of market fuel.

4. IN-SERVICE TESTING

- 4.1. When a check on vehicles is deemed necessary, emission tests in accordance with Annex III to this Directive are performed on pre-conditioned vehicles selected in accordance with the requirements of sections 2 and 3 of this Appendix.
- 4.2. Vehicles equipped with an OBD system may be checked for proper in-service functionality of the malfunction indication, etc., in relation to levels of emissions (e. g. the malfunction indication limits defined in Annex XI to this Directive) for the type-approved specifications.
- 4.3. The OBD system may be checked, for example, for levels of emissions above the applicable limit values with no malfunction indication, systematic erroneous activation of the malfunction indication and identified faulty or deteriorated components in the OBD system.
- 4.4. If a component or system operates in a manner not covered by the particulars in the type-approval certificate and/or information package for such vehicle types and such deviation has not been authorized under Article 5 (3) or (4) of Directive 70/156/EEC, with no malfunction indication by the OBD, the component or system must not be replaced prior to emission testing, unless it is determined that the component or system has been tampered with or abused in such a manner that the OBD does not detect the resulting malfunction.

5. EVALUATION OF RESULTS

- 5.1. The test results are submitted to the evaluation procedure in accordance with Appendix 4 to this Annex.
- 5.2. Test results must not be multiplied by deterioration factors.

6. PLAN OF REMEDIAL MEASURES

- ^{F3}6.1. When more than one vehicle is found to be an outlying emitter that either,

- meets the conditions of section 3.2.3 of Appendix 4 and where both the type-approval authority and the manufacturer agree that the excess emission is due to the same cause, or
- meets the conditions of section 3.2.4 of Appendix 4 where the type-approval authority has determined that the excess emission is due to the same cause,

the type-approval authority must request the manufacturer to submit a plan of remedial measures to remedy the non-compliance.]

- 6.2. The plan of remedial measures must be filed with the type-approval authority not later than 60 working days from the date of the notification referred to in section 6.1. The type-approval authority must within 30 working days declare its approval or disapproval of the plan of remedial measures. However, where the manufacturer can demonstrate, to the satisfaction of the competent type-approval authority, that further time is required to investigate the non-compliance in order to submit a plan of remedial measures, an extension is granted.
- 6.3. The remedial measures must apply to all vehicles likely to be affected by the same defect. The need to amend the type-approval documents must be assessed.
- 6.4. The manufacturer must provide a copy of all communications related to the plan of remedial measures, and must also maintain a record of the recall campaign, and supply regular status reports to the type-approval authority.
- 6.5. The plan of remedial measures must include the requirements specified in 6.5.1 to 6.5.11. The manufacturer must assign a unique identifying name or number to the plan of remedial measures.
 - 6.5.1. A description of each vehicle type included in the plan of remedial measures.
 - 6.5.2. A description of the specific modifications, alterations, repairs, corrections, adjustments, or other changes to be made to bring the vehicles into conformity including a brief summary of the data and technical studies which support the manufacturer's decision as to the particular measures to be taken to correct the non-conformity.
 - 6.5.3. A description of the method by which the manufacturer informs the vehicle owners.
 - 6.5.4. A description of the proper maintenance or use, if any, which the manufacturer stipulates as a condition of eligibility for repair under the plan of remedial measures, and an explanation of the manufacturer's reasons for imposing any such condition. No maintenance or use conditions may be imposed unless it is demonstrably related to the non-conformity and the remedial measures.
 - 6.5.5. A description of the procedure to be followed by vehicle owners to obtain correction of the non-conformity. This must include a date after which the remedial measures may be taken, the estimated time for the workshop to perform the repairs and where they can be done. The repair must be done expeditiously, within a reasonable time after delivery of the vehicle.
 - 6.5.6. A copy of the information transmitted to the vehicle owner.
 - 6.5.7. A brief description of the system which the manufacturer uses to assure an adequate supply of component or systems for fulfilling the remedial action. It must be indicated when there will be an adequate supply of components or systems to initiate the campaign.

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- 6.5.8. A copy of all instructions to be sent to those persons who are to perform the repair.
- 6.5.9. A description of the impact of the proposed remedial measures on the emissions, fuel consumption, driveability, and safety of each vehicle type, covered by the plan of remedial measures with data, technical studies, etc. which support these conclusions.
- 6.5.10. Any other information, reports or data the type-approval authority may reasonably determine is necessary to evaluate the plan of remedial measures.
- 6.5.11. Where the plan of remedial measures includes a recall, a description of the method for recording the repair must be submitted to the type-approval authority. If a label is used, an example of it must be submitted.
- 6.6. The manufacturer may be required to conduct reasonably designed and necessary tests on components and vehicles incorporating a proposed change, repair, or modification to demonstrate the effectiveness of the change, repair, or modification.
- 6.7. The manufacturer is responsible for keeping a record of every vehicle recalled and repaired and the workshop which performed the repair. The type-approval authority must have access to the record on request for a period of 5 years from the implementation of the plan of remedial measures.
- 6.8. The repair and/or modification or addition of new equipment shall be recorded in a certificate supplied by the manufacturer to the vehicle owner.

Appendix 4⁽⁶⁾

STATISTICAL PROCEDURE FOR IN-SERVICE CONFORMITY TESTING

1. This Appendix describes the procedure to be used to verify the in-service conformity requirements for the type I test.
2. Two different procedures are to be followed:
 1. One dealing with vehicles identified in the sample, due to an emission-related defect, causing outliers in the results (section 3).
 2. The other dealing with the total sample (section 4).

[^F3. PROCEDURE TO BE FOLLOWED WITH OUTLYING EMITTERS IN THE SAMPLE⁽⁷⁾

- 3.1. With a minimum sample size of three and a maximum sample size as determined by the procedure of paragraph 4, a vehicle is taken at random from the sample and the emissions of the regulated pollutants are measured to determine if it is an outlying emitter.
- 3.2. A vehicle is said to be an outlying emitter when the conditions given in either section 3.2.1 or section 3.2.2 are met.
 - 3.2.1. In the case of a vehicle that has been type-approved according to the limit values given in row A of the table in section 5.3.1.4 of Annex I, an outlying emitter is a vehicle where the applicable limit value for any regulated pollutant is exceeded by a factor of 1,2.
 - 3.2.2. In the case of a vehicle that has been type-approved according to the limit values given in row B of the table in section 5.3.1.4 of Annex I, an outlying emitter is a vehicle where the applicable limit value for any regulated pollutant is exceeded by a factor of 1,5.
 - 3.2.3. In the specific case of a vehicle with a measured emission for any regulated pollutant within the ‘intermediate zone’⁽⁸⁾.
 - 3.2.3.1. If the vehicle meets the conditions of this section, the cause of the excess emission must be determined and another vehicle is then taken at random from the sample.
 - 3.2.3.2. Where more than one vehicle meets the condition of this section, the type-approval authority and the manufacturer must determine if the excess emission from both vehicles is due to the same cause or not.
 - 3.2.3.2.1. If the type-approval authority and the manufacturer both agree that the excess emission is due to the same cause, the sample is regarded as having failed and the plan of remedial measures outlined in section 6 of Appendix 3 applies.
 - 3.2.3.2.2. If the type-approval authority and the manufacturer can not agree on either the cause of the excess emission from an individual vehicle or whether the causes for more than one vehicle are the same, another vehicle is taken at random from the sample, unless the maximum sample size has already been reached.
 - 3.2.3.3. When only one vehicle meeting the conditions of this section has been found, or when more than one vehicle has been found and the type-approval authority and the

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manufacturer agree it is due to different causes, another vehicle is taken at random from the sample, unless the maximum sample size has already been reached.

- 3.2.3.4. If the maximum sample size is reached and not more than one vehicle meeting the requirements of this section has been found where the excess emission is due to the same cause, the sample is regarded as having passed with regard to the requirements of section 3 of this Appendix.
- 3.2.3.5. If, at any time, the initial sample has been exhausted, another vehicle is added to the initial sample and that vehicle is taken.
- 3.2.3.6. Whenever another vehicle is taken from the sample, the statistical procedure of paragraph 4 of this Appendix is applied to the increased sample.
- 3.2.4. In the specific case of a vehicle with a measured emission for any regulated pollutant within the 'failure zone'⁽⁹⁾.
 - 3.2.4.1. If the vehicle meets the conditions of this section, the type-approval authority shall determine the cause of the excess emission and another vehicle is then taken at random from the sample.
 - 3.2.4.2. Where more than one vehicle meets the condition of this section, and the type-approval authority determines that the excess emission is due to the same cause, the manufacturer shall be informed that the sample is regarded as having failed, together with the reasons for that decision, and the plan of remedial measures outlined in section 6 of Appendix 3 applies.
 - 3.2.4.3. When only one vehicle meeting the conditions of this section has been found, or when more than one vehicle has been found and the type-approval authority has determined that it is due to different causes, another vehicle is taken at random from the sample, unless the maximum sample size has already been reached.
 - 3.2.4.4. If the maximum sample size is reached and not more than one vehicle meeting the requirements of this section has been found where the excess emission is due to the same cause, the sample is regarded as having passed with regard to the requirements of section 3 of this Appendix.
 - 3.2.4.5. If, at any time, the initial sample has been exhausted, another vehicle is added to the initial sample and that vehicle is taken.
 - 3.2.4.6. Whenever another vehicle is taken from the sample, the statistical procedure of paragraph 4 of this Appendix is applied to the increased sample.
- 3.2.5. Whenever a vehicle is not found to be an outlying emitter, another vehicle is taken at random from the sample.]
4. PROCEDURE TO BE FOLLOWED WITHOUT SEPARATE EVALUATION OF OUTLYING EMITTERS IN THE SAMPLE.
 - 4.1. With a minimum sample size of three the sampling procedure is set so that the probability of a batch passing a test with 40 % of the production defective is 0,95 (producer's risk = 5 %) while the probability of a batch being accepted with 75 % of the production defective is 0,15 (consumer's risk = 15 %).
 - 4.2. For each of the pollutants given in [^{X1}section 5.3.1.4 of Annex I,] the following procedure is used [^{F3}(see Figure I.9)].

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Editorial Information

X1 Substituted by [Corrigendum to Directive 98/69/EC of the European Parliament and of the Council of 13 October 1998 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC \(Official Journal of the European Communities L 350 of 28 December 1998\)](#).

Where

L = the limit value for the pollutant,
 X_i = the value of the measurement for the i -th vehicle of the sample,
 n = the current sample number.

4.3. The test statistic quantifying the number of non-conforming vehicles, i. e. $x_i > L$, is computed for the sample.

4.4. Then:

- if the test statistic does not exceed the pass decision number for the sample size given in the following table, a pass decision is reached for the pollutant,
- if the test statistic equals or exceeds the fail decision number for the sample size given in the following table, a fail decision is reached for the pollutant,
- otherwise, an additional vehicle is tested and the procedure is applied to the sample with one extra unit.

In the following table the pass and fail decision numbers are computed in accordance with the International Standard ISO 8422:1991.

5. A sample is regarded as having passed the test when it has passed both the requirements of sections 3 and 4 of this Appendix.

TABLE FOR ACCEPTANCE — REJECTION SAMPLING PLAN BY ATTRIBUTES

Cumulative sample size	Pass decision number	Fail decision number
3	0	—
4	1	—
5	1	5
6	2	6
7	2	6
8	3	7
9	4	8
10	4	8
11	5	9
12	5	9
13	6	10
14	6	11

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15	7	11
16	8	12
17	8	12
18	9	13
19	9	13
20	11	12

[^{F3}Figure I.9

In-service conformity testing — selection and test of vehicles]]]

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- (1) [^{F1}]^{F2}As defined in Part A of Annex II to Directive 70/156/EEC.
- (2) OJ L 36, 9.2.1998, p. 33.]
- (3) [^{F5}]^{F14}This section is applicable to new types from 1 January 2002.]]
- (4) [^{F5}The Lambda value must be calculated using the simplified Brettschneider equation as follows:
Where:

$\frac{[1]}{K1}$	=	Concentration in % vol.
	=	Conversion factor for NDIR measurement to FID measurement (provided by manufacturer of measurement equipment)
$[^{F3}Hcv]$	=	Atomic ratio of hydrogen to carbon [1,73], in the case of LPG [2,53], in the case of NG [4,0]
Ocv	=	Atomic ratio of oxygen to carbon [0,02], in the case of LPG [zero], in the case of NG [zero].]]
- (5) [^{F5}]^{F3}OJ L 350, 28.12.1998, p. 58.]
- (6) The provisions laid down in Appendix 4 must be re-examined and completed without delay in accordance with the procedure laid down in Article 13 of Directive 70/156/EEC.
- (7) [^{F3}On the basis of actual in-service data to be supplied before 31 December 2003 by the Member States, the requirements of this section may be reviewed and consider (a) whether the definition of outlying emitter needs to be revised with respect to vehicles that have been type-approved according to the limit values given in row B of the table in section 5.3.1.4 of Annex I, (b) whether the procedure for identifying outlying emitters should be amended and (c) whether the procedures for in-service conformity testing should be replaced at an appropriate time by a new statistical procedure. If appropriate, the Commission will propose the necessary amendments in accordance with the procedure laid down in Article 13 of Directive 70/156/EEC.
- (8) For any vehicle, the ‘intermediate zone’ is determined as follows. The vehicle shall meet the conditions given in either section 3.2.1 or section 3.2.2 and in addition, the measured value for the same regulated pollutant shall be below a level that is determined from the product of the limit value for the same regulated pollutant given in row A of the table in section 5.3.1.4 of Annex I multiplied by a factor of 2,5.
- (9) For any vehicle, the ‘failure zone’ is determined as follows. The measured value for any regulated pollutant exceeds a level that is determined from the product of the limit value for the same regulated pollutant given in row A of the table in section 5.3.1.4. of Annex I multiplied by a factor of 2.5.]]]

Textual Amendments

- F1** Substituted by Council Directive of 26 June 1991 amending Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles (91/441/EEC).
- F2** Substituted by Directive 98/69/EC of the European Parliament and of the Council of 13 October 1998 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC.
- F3** Substituted by Commission Directive 2002/80/EC of 3 October 2002 adapting to technical progress Council Directive 70/220/EEC relating to measures to be taken against air pollution by emissions from motor vehicles (Text with EEA relevance).
- F5** Inserted by Directive 98/69/EC of the European Parliament and of the Council of 13 October 1998 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC.
- F14** Substituted by Directive 2001/100/EC of the European Parliament and of the Council of 7 December 2001 amending Council Directive 70/220/EEC on the approximation of the laws of the Member States on measures to be taken against air pollution by emissions from motor vehicles (Text with EEA relevance).