

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laws of the Member States on measures to be taken against air pollution by emissions from motor vehicles (70/220/EEC) (repealed)

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ANNEX I

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

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	3.2.3.15.
	3.2.3.16.
	3.2.3.17.
	3.2.3.18.
	3.2.3.18.1.
	3.2.3.18.2.
3.2.4.	Additional equipment required when testing diesel-engined vehicles	
3.3.	Variable dilution device with constant flow control by orifice (CFO-CVS)...	
	3.3.1.
	3.3.1.1.
	3.3.1.2.
	3.3.1.3.
	3.3.1.4.
	3.3.1.5.
	3.3.1.6.
	3.3.1.7.
	3.3.1.8.
	3.3.1.9.
	3.3.1.10.
	3.3.1.11.
	3.3.1.12.
	3.3.1.13.
	3.3.1.14.
	3.3.1.15.

Appendix 6

METHOD OF CALIBRATING THE EQUIPMENT

1. ESTABLISHMENT OF THE CALIBRATION CURVE
 - 1.1.

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- 1.2.
- 1.3.
- 1.4.
- 1.5. Trace of the calibration curve
- 1.6.
- 1.7. Verification of the calibration
 - 1.7.1.
 - 1.7.2.
 - 1.7.3.
 - 1.7.4.
- 2. CHECK FOR FID, HYDROCARBON RESPONSE
 - 2.1. Detector response optimization
 - 2.2. Calibration of the HC analyzer
 - 2.3. Response factors of different hydrocarbons and recommended limits
 - 2.4. Oxygen interference check and recommended limits
- 3. EFFICIENCY TEST OF THE NO_x CONVERTER
 - 3.1.
 - 3.2.
 - 3.3.
 - 3.4.
 - 3.5.
 - 3.6.
 - 3.7.
 - 3.8.
 - 3.9.
- 4. CALIBRATION OF THE CVS SYSTEM
 - 4.1.
 - 4.1.1.
 - 4.1.2.
 - 4.2. Calibration of the positive displacement pump (PDP)
 - 4.2.1.
 - 4.2.2.
 - 4.2.2.1.
 - 4.2.2.2.
 - 4.2.2.3.
 - 4.2.3.
 - 4.2.3.1.
 - 4.2.3.2.
 - 4.2.3.3.
 - 4.2.4. Data analysis
 - 4.2.4.1.
 - 4.2.4.2.
 - 4.2.4.3.
 - 4.3. Calibration of the critical-flow venturi (CFV)
 - 4.3.1.
 - 4.3.2.
 - 4.3.3.
 - 4.3.4.
 - 4.3.5.
 - 4.3.6.

4.3.7.

Appendix 7

TOTAL SYSTEM VERIFICATION

1.
2.
 - 2.1.
3.
 - 3.1.

Appendix 8

CALCULATION OF THE EMISSION OF POLLUTANTS

1. GENERAL
 - 1.1.
 - 1.2. Volume determination
 - 1.2.1.
 - 1.2.2.
 - 1.2.3.
 - 1.3. Calculation of the corrected concentration of pollutants in the sampling...
 - 1.4. Determination of the NO humidity correction factor
 - 1.5. Example
 - 1.5.1. Data
 - 1.5.1.1.
 - 1.5.1.2.
 - 1.5.1.3.
 - 1.5.2. Calculation
 - 1.5.2.1.
 - 1.5.2.2.
 - 1.5.2.3.
2. SPECIAL PROVISIONS RELATING TO VEHICLES EQUIPPED WITH COMPRESSION-IGNITION ENGINES
 - 2.1. HC measurement for compression-ignition engines
 - 2.2. Determination of particulates

ANNEX IV

TYPE II TEST

1. INTRODUCTION
2. CONDITIONS OF MEASUREMENT
 - 2.1.
 - 2.2.
 - 2.2.1.

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2.3.
2.4.
2.5.	Components for adjusting the idling speed
2.5.1.	Definition
2.5.1.1.
2.5.2.	Determination of measurement points
2.5.2.1.	.....
2.5.2.2.	.....
2.5.2.3.	.....
2.5.2.4.	.....
2.5.2.4.1.	.....
2.5.2.4.2.	.....
2.5.2.5.	.....
2.5.2.5.1.	.....
2.5.2.5.2.	.....
2.5.2.6.	.....
3.	SAMPLING OF GASES
3.1.	.....
3.2.	.....
3.3.	.....
3.4.	.....

ANNEX V TYPE III TEST

1.	INTRODUCTION
2.	GENERAL PROVISIONS
2.1.	.....
2.2.	.....
3.	TEST CONDITIONS
3.1.	.....
3.2.	.....
4.	TEST METHOD
4.1.	.....
5.	METHOD OF VERIFICATION OF THE CRANKCASE VENTILATION SYSTEM
5.1.
5.2.
5.3.
5.4.
5.5.
5.6.
5.7.
6.	ADDITIONAL TEST METHOD
6.1.
6.2.

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- 6.3.
- 6.4.
- 6.5. Remark
 - 6.5.1.
 - 6.5.2.
 - 6.5.3.
 -

ANNEX VI TYPE IV TEST

- 1. INTRODUCTION
- 2. DESCRIPTION OF TEST
- 3. VEHICLE AND FUEL
 - 3.1. Vehicle
 - 3.1.1.
 - 3.2. Fuel
 - 3.2.1.
- 4. TEST EQUIPMENT FOR EVAPORATIVE TEST
 - 4.1. Chassis dynamometer
 - 4.2. Evaporative emission measurement enclosure
 - 4.2.1. Variable-volume enclosure
 - 4.2.2. Fixed-volume enclosure
 - 4.2.2.1.
 - 4.2.2.2.
 - 4.3. Analytical systems
 - 4.3.1. Hydrocarbon analyser
 - 4.3.1.1.
 - 4.3.1.2.
 - 4.3.1.3.
 - 4.3.1.4.
 - 4.3.2. Hydrocarbon analyser data recording system
 - 4.3.2.1.
 - 4.4. Fuel tank heating (only applicable for gasoline canister load option)...
 - 4.4.1.
 - 4.4.2.
 - 4.5. Temperature recording
 - 4.5.1.
 - 4.5.2.
 - 4.5.3.
 - 4.5.4.
 - 4.5.5.
 - 4.6. Pressure recording
 - 4.6.1.
 - 4.6.2.
 - 4.6.3.
 - 4.7. Fans
 - 4.7.1.

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- 4.7.2.
- 4.8. Gases
 - 4.8.1.
 - 4.8.2.
- 4.9. Additional equipment
 - 4.9.1.
- 5. TEST PROCEDURE
 - 5.1. Test preparation
 - 5.1.1.
 - 5.1.2.
 - 5.1.3.
 - 5.1.3.1.
 - 5.1.3.2.
 - 5.1.3.3.
 - 5.1.3.4.
 - 5.1.3.5.
 - 5.1.3.6.
 - 5.1.3.7.
 - 5.1.3.8.
 - 5.1.3.9.
 - 5.1.3.10.
 - 5.1.3.11.
 - 5.1.4.
 - 5.1.4.1.
 - 5.1.4.2.
 - 5.1.4.3.
 - 5.1.5. Canister loading with repeated heat builds to breakthrough
 - 5.1.5.1.
 - 5.1.5.2.
 - 5.1.5.3.
 - 5.1.5.4.
 - 5.1.5.5.
 - 5.1.5.6.
 - 5.1.5.7.
 - 5.1.6. Butane loading to breakthrough
 - 5.1.6.1.
 - 5.1.6.2.
 - 5.1.6.3.
 - 5.1.6.4.
 - 5.1.6.5.
 - 5.1.7. Fuel drain and refill
 - 5.1.7.1.
 - 5.1.7.2.
 - 5.2. Preconditioning drive
 - 5.2.1.
 - 5.3. Soak
 - 5.3.1.
 - 5.4. Dynamometer test
 - 5.4.1.
 - 5.4.2.
 - 5.5. Hot soak evaporative emissions test
 - 5.5.1.

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	5.5.3.
	5.5.4.
	5.5.5.
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	5.5.7.
	5.5.8.
5.6.	Soak	
	5.6.1.
5.7.	Diurnal test	
	5.7.1.
	5.7.2.
	5.7.3.
	5.7.4.
	5.7.5.
	5.7.6.
	5.7.7.
	5.7.8.
6.	CALCULATION	
	6.1.	.....
	6.2.	Overall results of test
7.	CONFORMITY OF PRODUCTION	
	7.1.	.....
	7.2.	Test for leakage
	7.2.1.	.....
	7.2.2.	.....
	7.2.3.	.....
	7.2.4.	.....
	7.3.	Test for venting
	7.3.1.	.....
	7.3.2.	.....
	7.3.3.	.....
	7.3.4.	.....
	7.3.5.	.....
	7.3.6.	.....
	7.4.	Purge test
	7.4.1.	.....
	7.4.2.	.....
	7.4.3.	.....
	7.4.4.	.....
		7.4.4.1.
		7.4.4.2.
		7.4.4.3.
	7.5.	.....
	7.5.1.	.....
	7.5.2.	.....
	7.5.3.	.....
		7.5.3.1.
		7.5.3.2.
	7.6.	.....

Appendix 1

CALIBRATION OF EQUIPMENT FOR EVAPORATIVE EMISSION TESTING

1. CALIBRATION FREQUENCY AND METHODS
 - 1.1.
 - 1.2.

2. CALIBRATION OF THE ENCLOSURE
 - 2.1. Initial determination of enclosure internal volume
 - 2.1.1.
 - 2.1.2.
 - 2.1.3.
 - 2.2. Determination of chamber background emissions
 - 2.2.1.
 - 2.2.2.
 - 2.2.3.
 - 2.2.4.
 - 2.2.5.
 - 2.2.6.
 - 2.2.7.
 - 2.2.8.
 - 2.2.9.
 - 2.3. Calibration and hydrocarbon retention test of the chamber
 - 2.3.1.
 - 2.3.2.
 - 2.3.3.
 - 2.3.4.
 - 2.3.5.
 - 2.3.6.
 - 2.3.7.
 - 2.3.8.
 - 2.3.9.
 - 2.3.10.
 - 2.3.11.
 - 2.4. Calculations

3. CHECKING OF FID HYDROCARBON ANALYZER
 - 3.1. Detector response optimization
 - 3.2. Calibration of the HC analyzer
 - 3.3. Oxygen interference check and recommended limits

4. CALIBRATION OF THE HYDROCARBON ANALYZER
 - 4.1.
 - 4.2.
 - 4.3.
 - 4.4.
 - 4.5.

Appendix 2

ANNEX VII TYPE VI TEST

.....

1. INTRODUCTION
2. TEST EQUIPMENT
 - 2.1. Summary
 - 2.1.1.
 - 2.2. Chassis dynamometer
 - 2.2.1.
 - 2.2.2.
 - 2.3. Sampling system
 - 2.3.1.
 - 2.4. Analytical equipment
 - 2.4.1.
 - 2.4.2.
 - 2.5. Gases
 - 2.5.1.
 - 2.6. Additional equipment
 - 2.6.1.
3. TEST SEQUENCE AND FUEL
 - 3.1. General requirements
 - 3.1.1.
 - 3.1.2.
 - 3.2. Test procedure
 - 3.2.1.
 - 3.3. Preparation for the test
 - 3.3.1.
 - 3.4. Test fuel
 - 3.4.1.
4. VEHICLE PRECONDITIONING
 - 4.1. Summary
 - 4.1.1.
 - 4.2. Preconditioning
 - 4.2.1.
 - 4.2.2.
 - 4.2.3.
 - 4.2.4.
 - 4.2.5.
 - 4.2.6.
 - 4.2.7.
 - 4.3. Soak methods
 - 4.3.1.
 - 4.3.2.
 - 4.3.3.

	4.3.3.1.
	4.3.3.2.
	4.3.3.3.
	4.3.3.4.
	4.3.4.
5.	DYNAMOMETER PROCEDURE
5.1.	Summary
	5.1.1.
5.2.	Dynamometer operation
	5.2.1. Cooling fan
	5.2.1.1.
	5.2.1.2.
	5.2.1.3.
	5.2.1.4.
	5.2.3.
	5.2.4.
	5.2.5.
	5.2.6.
	5.2.7.
	5.2.8.
	5.2.9.
	5.2.10.
	5.2.11.
5.3.	Performing the test
	5.3.1.
	5.3.2.
	5.3.3.
6.	OTHER REQUIREMENTS
6.1.	Irrational emission control strategy
	6.1.1.

ANNEX VIII

Description of the ageing test for verifying the durability of anti-pollution devices

1.	INTRODUCTION
2.	TEST VEHICLE
	2.1.
3.	FUEL
4.	VEHICLE MAINTENANCE AND ADJUSTMENTS
5.	VEHICLE OPERATION ON TRACK, ROAD OR ON CHASSIS DYNAMOMETER
5.1.	Operating cycle
	5.1.1.
	5.1.2.
5.2.	Test equipment
	5.2.1. Chassis dynamometer

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- 5.2.1.1.
- 5.2.1.2.
- 5.2.1.3.
- 5.2.1.4.
- 5.2.1.5.
- 5.2.2. Operation on track or road

6. MEASURING EMISSIONS OF POLLUTANTS

ANNEX IX

- A. Specifications of reference fuels for testing vehicles to the emission...
 - 1. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR...
 - 2. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR...
- B. Specifications of reference fuels for testing vehicles to the emission...
 - 1. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR...
 - 2. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR...
- C. Specifications of reference fuel to be used for testing vehicles...

ANNEX IXa

SPECIFICATIONS OF GASEOUS REFERENCE FUELS

- A. Technical data of the LPG reference fuels
 - 1. TECHNICAL DATA OF THE LPG REFERENCE FUELS USED FOR TESTING...
 - 2. TECHNICAL DATA OF THE LPG REFERENCE FUELS USED FOR TESTING...
- B. Technical data of the ng reference fuels

ANNEX X

MODEL

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Appendix 1

Addendum to EC type-approval certificate No...

.....
.....

Appendix 2
OBD-related information

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ANNEX XI
ON-BOARD DIAGNOSTICS (OBD) FOR MOTOR VEHICLES

- 1. INTRODUCTION
- 2. DEFINITIONS
 - 2.1.
 - 2.2.
 - 2.3.
 - 2.4.
 - 2.5.
 - 2.6.
 - 2.7.
 - 2.8.
 - 2.9.
 - 2.10.
 - 2.11.
 - 2.12.
 - 2.13.
 - 2.14.
 - 2.15.
 - 2.16.
 - 2.17.
 - 2.18.
 - 2.19.
 - 2.20.
- 3. REQUIREMENTS AND TESTS
 - 3.1.
 - 3.1.1.
 - 3.1.2.
 - 3.2.
 - 3.2.1. Temporary disablement of the OBD system
 - 3.2.1.1.
 - 3.2.1.2.
 - 3.2.1.3.
 - 3.2.2. Engine misfire — vehicles equipped with positive-ignition engines
 - 3.2.2.1.
 - 3.2.2.2.
 - 3.3. Description of tests
 - 3.3.1.
 - 3.3.2.
 - 3.3.3. Monitoring requirements for vehicles equipped with positive-ignition engines

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	3.3.3.1.
	3.3.3.2.
	3.3.3.3.
	3.3.3.4.
	3.3.3.5.
	3.3.3.6.
	3.3.4. Monitoring requirements for vehicles equipped with compression-ignition engines
	3.3.4.1.
	3.3.4.2.
	3.3.4.3.
	3.3.4.4.
	3.3.4.5.
	3.3.5.
3.4.	.....
3.5.	Activation of malfunction indicator (MI)
	3.5.1.
	3.5.2.
3.6.	Fault code storage
	3.6.1.
	3.6.2.
3.7.	Extinguishing the MI
	3.7.1.
	3.7.2.
3.8.	Erasing a fault code
	3.8.1.
3.9.	Bi-fuelled gas vehicles
	3.9.1.
4.	REQUIREMENTS RELATING TO THE TYPE-APPROVAL OF ON-BOARD DIAGNOSTIC SYSTEMS
	4.1.
	4.2.
	4.2.1.
	4.2.2.
	4.3.
	4.4.
	4.5. Bi-fuelled gas vehicles
	4.5.1.
	4.5.2.
	4.6. Deficiency period
	4.6.1.
	4.6.1.1.
	4.6.2.
	4.7.
5.	ACCESS TO OBD INFORMATION
	5.1.
	5.2.
	5.2.1.
	5.2.2.
	5.2.3.

Appendix 1

FUNCTIONAL ASPECTS OF ON-BOARD DIAGNOSTIC (OBD) SYSTEMS

1. INTRODUCTION
2. DESCRIPTION OF TEST
 - 2.1.
 - 2.2.
 - 2.3.
3. TEST VEHICLE AND FUEL
 - 3.1. Vehicle
 - 3.2. Fuel
4. TEST TEMPERATURE AND PRESSURE
 - 4.1.
5. TEST EQUIPMENT
 - 5.1. Chassis dynamometer
6. OBD TEST PROCEDURE
 - 6.1.
 - 6.2. Vehicle preconditioning
 - 6.2.1.
 - 6.2.2.
 - 6.3. Failure modes to be tested
 - 6.3.1. Positive-ignition engined vehicles:
 - 6.3.1.1.
 - 6.3.1.2.
 - 6.3.1.3.
 - 6.3.1.4.
 - 6.3.1.5.
 - 6.3.2. Compression-ignition engined vehicles:
 - 6.3.2.1.
 - 6.3.2.2.
 - 6.3.2.3.
 - 6.3.2.4.
 - 6.3.2.5.
 - 6.4. OBD system test
 - 6.4.1. Vehicles fitted with positive-ignition engines:
 - 6.4.1.1.
 - 6.4.1.2.
 - 6.4.1.3.
 - 6.4.1.4.
 - 6.4.1.5.
 - 6.4.1.6.
 - 6.4.2. Vehicles fitted with compression-ignition engines:
 - 6.4.2.1.
 - 6.4.2.2.
 - 6.4.2.3.
 - 6.4.2.4.
 - 6.4.2.5.

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- 6.5. Diagnostic signals
 - 6.5.1.1.
 - 6.5.1.2.
 - 6.5.1.3.
 - 6.5.1.4.
 - 6.5.1.5.
 - 6.5.2.
 - 6.5.3.
 - 6.5.3.1.
 - 6.5.3.2.
 - 6.5.3.3.
 - 6.5.3.4.
 - 6.5.3.5.
- 6.6. Specific requirements regarding the transmission of diagnostic signals from bi-fuelled...
 - 6.6.1.
 - 6.6.2.
 - 6.6.3.

Appendix 2

ESSENTIAL CHARACTERISTICS OF THE VEHICLE FAMILY

- 1. PARAMETERS DEFINING THE OBD FAMILY
- 2.

ANNEX XII

EC TYPE-APPROVAL FOR A VEHICLE FUELLED BY LPG OR NATURAL GAS WITH REGARD TO ITS EMISSIONS

- 1. INTRODUCTION
- 2. DEFINITIONS
 - 2.1.
 - 2.2.
 - 2.2.1.
 - 2.2.2.
- 3. GRANTING OF AN EC TYPE-APPROVAL
 - 3.1.
 - 3.1.1.
 - 3.1.1.1.
 - 3.1.2.
 - 3.1.3.
 - 3.2.
 - 3.2.1.
 - 3.2.2.
 - 3.2.3.
- 4. GENERAL CONDITIONS

4.1.

ANNEX XIII

EC TYPE-APPROVAL OF REPLACEMENT CATALYTIC CONVERTER AS SEPARATE TECHNICAL UNIT

1. SCOPE

2. DEFINITIONS

- 2.1.
- 2.2.
- 2.3.
- 2.4.
 - 2.4.1.
 - 2.4.2.
 - 2.4.3.
 - 2.4.4.
 - 2.4.5.
 - 2.4.6.
 - 2.4.7.
 - 2.4.8.
- 2.5.
- 2.6.
- 2.7.

3. APPLICATION FOR EC TYPE-APPROVAL

- 3.1.
- 3.2.
- 3.3.
 - 3.3.1.
 - 3.3.2.
 - 3.3.3.

4. GRANTING OF EC TYPE-APPROVAL

- 4.1.
- 4.2.
- 4.3.
- 4.4.

5. EC TYPE-APPROVAL MARKING

- 5.1.
- 5.2.
- 5.3.
- 5.4.

6. REQUIREMENTS

- 6.1. General requirements
 - 6.1.1.
 - 6.1.2.
 - 6.1.3.
 - 6.1.4.

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- 6.2. Requirements regarding emissions
 - 6.2.1. Determination of the basis for comparison
 - 6.2.2. Exhaust gas test with replacement catalytic converter
 - 6.2.3. Evaluation of the emission of pollutants of vehicles equipped with...
- 6.3. Requirements regarding noise and exhaust back-pressure
- 6.4. Requirements regarding durability
- 6.5. Requirements regarding OBD compatibility (applicable only to replacement catalytic converters...
 - 6.5.1.
 - 6.5.2.
 - 6.5.3.
 - 6.5.4.
 - 6.5.5.
- 7. DOCUMENTATION
 - 7.1.
 - 7.1.1.
 - 7.1.2.
 - 7.1.3.
 - 7.2.
- 8. MODIFICATION OF THE TYPE AND AMENDMENTS TO APPROVALS
- 9. CONFORMITY OF PRODUCTION
 - 9.2. Special provisions
 - 9.2.1.
 - 9.2.2.

Appendix 1

Information document No ... relating to the EC type-approval of replacement catalytic converters (Directive 70/220/EEC as last amended by Directive ...

.....
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Appendix 2

Model

.....
.....

Addendum

to EC type-approval certificate No ...

Appendix 3

.....