1. ------IND- **2006 0595 D-- EN-** ------ 20061115 --- --- PROJET

Data Sheet No.: 16 12 059

Draft

(As at: 26.10.2006)

[30.] Order for the Amendment of the Automobile Safety Act *)

of 2006

The following is decreed, in each case in conjunction with Section 1 paragraph 2 of the Act on the adaptation of jurisdiction of 16 August 2002 (Federal Law Gazette I p. 3165) and the Law for the establishment of administrative and legal institutions of 22 November 2005 (Federal Law Gazette I p. 3197),

- by the Federal Ministry of Transport, Building and Urban Development on the basis of Section 6 paragraph 1 No. 2 letters a, c, e and t of the Road Traffic Act in the version promulgated on 5 March 2003 (Federal Law Gazette I p. 310, 919),

- by the Federal Ministry of Transport, Building and Urban Development and the Federal Ministry of the Environment, Nature Protection and Reactor Safety.
  - on the basis of Section 6 paragraph 1 No. 3 letter d and No. 5a in conjunction with paragraph 2a of the Road Traffic Act in the version promulgated on 5 March 2003 (Federal Law Gazette I p. 310, 919) and
  - on the basis of Section 38 paragraph 2 sentence 1 in conjunction with Section 51 of the Federal Air Pollution Control Act in the version promulgated on 26 September 2002 (Federal Law Gazette I p. 3830), after consultation with the participating parties:

---

*) The obligations arising from Directive 98/34/ EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services (OJ L 204 p. 37), as amended by Directive 98/48/EC of the European

Parliament and of the Council of 20 July 1998 (OJ L 217 p. 18), have been observed.

Article 1

The Automobile Safety Act in the version promulgated on 28 September 1988 (Federal Law Gazette I p. 1793), as amended by ***[**……* *(Federal Law Gazette I p. ...)]*, is amended as follows.

1. In the contents overview, "Annex XXVII (repealed)" now reads as follows:
   "Annex XXVII Measures to combat air pollution due to particulate matter from commercial vehicles and from mobile machines and units with spontaneous-ignition engines."

2. Sect. 48 is amended as follows:
   a) The previous wording becomes paragraph 1.
   b) The following paragraph 2 is added:
      "(2) Particulate reduction systems intended for the retrofitting of commercial vehicles or mobile machines or units powered by spontaneous-ignition engines, shall comply with the requirements of Annexes XXVI or XXVII and shall be tested, approved and installed in accordance with the respective annex."

3. Annex XIV is amended as follows:
   a) The following number 2.4 is inserted after No. 2.3:
      "2.4 Particulate reduction classes
      The emission of air-polluting particulate matter forms the basis of the particulate reduction classes."
   b) The following number 3.4 is added after number 3.3.1.
      "3.4 Particulate reduction classes
      3.4.1 Particulate reduction class PMK 01
      Particulate reduction class PMK 01 includes motor vehicles that belong to pollutant class S1 No. 2, 3 or 4, do not already comply with the limits for Group 1 in the table in Section 5.3.1.4 of Annex I to the directive named therein and have been fitted with a

particulate reduction system approved in accordance with number 6.2 of Annex XXVI, that ensures that the limit value of 0.170 g/km for the particulate mass is not exceeded.

3.4.2 Particulate reduction class PMK 0

Particulate reduction class PMK 0 includes motor vehicles that belong to

1. Pollutant class S1 No. 1 fitted with a particulate reduction system approved according to number 8 of Annex XXVII that ensures that the limit value of 0.150 g/kWh for the particulate mass is not exceeded during the ESC test according to No. 1.3.1 Annex III of Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2005/78/EC of 14 November 2005 (OJ L 313 p.1) or
2. pollutant class S1 No. 2, 3, 4, 5 or 6 and have been fitted with an approved particulate reduction system approved according to No. 6.2 of Annex XXVI that ensures that the limit value of 0.100 g/km for the particulate mass is not exceeded or
3. to pollutant class S1 No. 7, 8 or 9 and have been fitted with a particulate reduction system approved according to number 8 of Annex XXVII and that ensures that the limit value of 0.200 g/kWh for the particulate mass is not exceeded during the NRSC test according to No. 3 Annex III of Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 (OJ 1998 L 59 p.1) as amended by Directive 2004/26/EC of the European Parliament and of the Council dated 21 April 2004 (OJ L 225 p.3) or
4. belongs to pollutant class S2.

3.4.3 Particulate reduction class PMK 1

Particulate reduction class PMK 1 includes motor vehicles that belong to

1. pollutant class S1 No. 1 or pollutant class S2 No. 1 or 2 and have been fitted with a particulate reduction system approved in accordance with number 8 of Annex XXVII that ensures that the limit value of 0.100 g/kWh for the particulate mass is not exceeded during the ESC test according to No. 1.3.1 Annex III of Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2005/78/EC of 14 November 2005 (OJ L 313 p. 1) or
2. to pollutant class S1 No. 2, 3, 4, 5, 6 or pollutant class S2 No. 3, 4, 5, 6, 7, 9, 10 or 11 and have been fitted with a particulate reduction system approved in

accordance with No. 6.2 of Annex XXVI that ensures that the limit value of 0.050 g/km for the particulate mass is not exceeded or

3. to pollutant class S1 No. 7, 8, 9 or pollutant class S2 No. 8 or 12 and have been fitted with a particulate reduction system approved according to number 8 of Annex XXVII that ensures that the limit value of 0.100 g/kWh for the particulate mass is not exceeded during the NRSC test according to No. 3 Annex III of Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 (OJ 1998 L 59 p. 1) as amended by Directive 2004/26/EC of the European Parliament and of the Council of 21 April 2004 (OJ L 225 p. 3) or
4. belong to pollutant class S3.

3.4.4 Particulate reduction class PMK 2

Particulate reduction class PMK 2 includes motor vehicles that belong to

1. pollutant class S1 No. 1, S2 No. 1 or 2 or S3 No. 9 or 10 and have been fitted with a particulate reduction system approved in accordance with No. 8 of Annex XXVII that ensures that the limit value of 0.020 g/kWh for the particulate mass is not exceeded during the ESC test according to No. 1.3.1, and of 0.030 g/kWh during the E|TC test according to 1.3.3 in Annex III to Directive 2005/55/EC of the European Parliament and of the Council dated 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2005/78/EC of 14 November 2005 (OJ L 313 p. 1) or
2. pollutant class S1 No. 2, 3, 4, 5, 6, pollutant class S 2 No. 3, 4, 5, 6, 7, 9, 10 or 11 or pollutant class S3 No. 1, 2, 3, 4, 5, 6, 7 or 8 and have been fitted with a particulate reduction system approved in accordance with No. 6.2 of Annex XXVI that ensures that the limit value of 0.025 g/km for the particulate mass is not exceeded or
3. belong to pollutant class S1 No. 7, 8, 9 or pollutant class S2 No. 8 or 12 and have been fitted with a particulate reduction system approved according to number 8 of Annex XXVII that ensures that the limit value of 0.025 g/kWh for the particulate mass is not exceeded during the NRTC test according to No. 4 of Annex III to Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 (OJ 1998 L 59 p. 1) as amended by Directive 2004/26/EC of the European Parliament and of the Council of 21 April 2004 (OJ L 225 p. 3) or
4. belong to pollutant class S4 or S5.

3.4.5 Particulate reduction class PMK 3

Particulate reduction class PMK 3 includes motor vehicles that

1. belong to pollutant class S 2 No. 3, 4, 5, 6, 7, 9, 10 or 11 or pollutant class S3 No.1, 2, 3, 4, 5, 6, 7 or 8 or pollutant class S4 No.1, 2, 3 or 4 and have been fitted with a particulate reduction system approved in accordance with No. 6.2 of Annex XXVI that ensures that the limit value of 0.0125 g/km for the particulate mass is not exceeded or
2. belong to EEV Class 1.

3.4.6 Particulate reduction class PMK 4

Particulate reduction class PMK 4 includes motor vehicles that

1. belong to pollutant class S2 No. 3, 4, 5, 6, 7, 9, 10 or 11 or pollutant class S3 No.1, 2, 3, 4, 5, 6, 7 or 8 or pollutant class S4 No.1, 2, 3 or 4 and have been fitted with a particulate reduction system approved in accordance with No. 6 of Annex XXVI that ensures that the limit value of 0.005 g/km for the particulate mass is not exceeded.

4. Annex XXVI is amended as follows:

a) The contents list is amended as follows:

a) After the details for number 2 the following details are added:

"2.1.1 Stage PM 01

2.1.2 Stage PM 0",

b) The previous numbers 2.1.1 to 2.1.4 become numbers 2.1.3 to 2.1.6.

b) The following paragraph is added to number 1.1:

"The requirements of this Annex can also be used as appropriate for commercial vehicles of category N_1 that fall within the area of application of Section 47 paragraph 1. The field of application of approved particulate reduction systems for passenger cars or mobile homes can furthermore be extended to the corresponding commercial vehicles of category N_1. Compliance with the requirements according to number 4 of this Annex is to be verified. Annex XIV No. 3.4 applies to the assignment of the particulate reduction class".

c) The previous number 2.1.1 is replaced by the following new numbers:

"2.1.1 Stage PM 01, if they meet the requirements of provisions of m, n or o given in the Annex to the regulation of Section 47 paragraph 1, but do not meet the limit values for group I of the table in section 5.3.1.4 of Annex I and have been fitted with a particulate reduction system approved in accordance with number 6.2.3 that ensures that the limit value of 0.170 g/km for the particulate mass is not exceeded;

2.1.2 Stage PM 0, if

a) they meet the requirements of Section 47 paragraph 3 No. 3 or 4 or

b) they have more than six seating positions including the driver's seat or a permissible total weight of more than 2500 kg and meet the requirements of Section 47 paragraph 3 No. 6 or 7 and furthermore only the limit values for groups II or III of the table in section 5.3.1.4 of Annex I are complied with

and have been fitted with a particulate reduction system approved in accordance with number 6.2.3 that ensures that the limit value of 0.100 g/km for the particulate mass is not exceeded",

d) The previous numbers 2.1.1 to 2.1.4 become numbers 2.1.3 to 2.1.6,

e) In number 4.1.2 the designation "• Class 0: Euro 1" is inserted in the third dash before the designation "Class 1".

f) In number 4.5.1.1 sentence 1 "PM 01, PM 0" is inserted after the words "reduction stage",

g) In number 6.2.3 "PM 1" in sentence 2 is replaced by "PM 01".

h) In number 10.1.1 sentence 1, the words "according to Section 47a in conjunction with Annex XIa No. 3.2" are replaced by the words "on motor vehicles with compression ignition engines according to Annex VIIIc No. 3.1.1.1.1".

i) In Annex III, "PM 1" at the first dash is replaced by "PM 01",

j) Annex V No. 4.1 is amended as follows:

a) The following dashes are placed before the first dash:

" –"Stage PM 01 added with type: (enter); KBA (enter No.), from (date)" *)

–"Stage PM 0 added with type: (enter); KBA (enter No.) from (date)"*),

b) In the last line before the footnote, the words “responsible persons according to Section 47a paragraph 3 StVZO” are replaced by the words “person responsible for the investigation of the exhaust gas in according with Section 29 paragraph 12 or Section 47a paragraph 3 StVZO”.

5. Annex XXVII as seen in the Annex to this Order is inserted after Annex XXVI.

Article 2

This Order shall enter into force on the day after promulgation

---

The Federal Council has approved.

Berlin, 2007

The Federal Minister
for Transport, Building and Urban Development

The Federal Minister
for Environment, Nature Preservation and Reactor Safety

Draft

(As at: 26.10.2006)

Annex to Article 1 No. 5

"Annex XXVII

(to Section 48(2) and Annex XIV No. 3.4)

Measures to combat air pollution due to particulate matter from commercial vehicles, mobile machines or units with spontaneous-ignition engines

Contents list

1. General

1.1 Area of application

This Annex regulates the requirements for particulate reduction systems that are intended for the retrofitting of commercial vehicles or mobile machines or units powered by spontaneous-ignition engines if Section 47(6) or Section 8b applies to either them or their engines. Within the meaning of this regulation,

- motor vehicles of Category M, except passenger cars (M_1)
- motor vehicles of Category N

according to Annex II section A and section C of Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers (OJ L 42 p. 1), as amended by Directive 2001/116/EC of 20 December 2001 (OJ 2002 No. L 18 p. 1), that are powered by spontaneous-ignition engines and operated on diesel fuel according to Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (OJ L 350 p. 58), as amended by Directive 2003/17/EC of 3 March 2003 (OJ 2003 No. L 76 p. 10), are regarded as commercial vehicles.

1.2 Definition of terms and abbreviations

Load condition:
Constant particulate load condition of the particulate reduction system under specific driving conditions without external regeneration measures

ESC test cycle:
Test cycle, consisting of 13 steady-state test phases, according to Annex III Appendix 1 to Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p.1) on the approximation of the laws of the Member States relating to the measures to be taken against the emission of gaseous and particulate pollutants from compression-ignition engines for use in vehicles, and the emission of gaseous pollutants from positive-ignition engines fuelled with natural gas or liquefied petroleum gas fur use in vehicles,

as amended by Commission Directive 2006/51/EC of 6 June 2006 (OJ L 152 p.11).

ELR test cycle:
Test cycle, consisting of a sequence of load steps with the rotational speed remaining constant, according to Annex III Appendix I to Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2006/51/EC of 6 June 2006 (OJ. L 152 p.11).

ETC test cycle:
Test cycle, consisting of transient, alternating phases, according to Annex III Appending 2 to Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2006/51/EC of 6 June 2006 (OJ L 152 p.11).

NRSC cycle:
–Steady-state test for mobile machines and units according to Annex III No. 3 of Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 (OJ 1998 No. L 59 p. 1) on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery, as amended by Directive 2004/26/EC of the European Parliament and of the Council of 21 April 2004 (OJ L 225 p.3).

NRTC:
Dynamic test for mobile machines and units according to Annex III No. 4 of Directive 97/68/EC as amended by Directive 2004/26/EC.

Particulate reduction system:
An exhaust gas treatment for reducing particulate emissions by mechanical and/or aerodynamic separation and by diffusion and/or inertia effects. Engine-specific modifications to structural components, electronic elements and electronic components are not considered part of the particulate reduction

systems. If, however, additional measures with respect to emission-relevant components and/or system components such as modifying the exhaust gas recirculation (EGR) control for further proper functioning are necessary for retrofitting with the PARTICULATE REDUCTION SYSTEM, these measures must be approved by the engine manufacturer.

Regulated particulate reduction system:
Particulate reduction system that has a gravimetric particulate retention, determined according to number 5 or number 6, of at least 90%.

Continuous regeneration
Regeneration process of a treatment system that runs permanently or at least once per test cycle.

Unregulated particulate reduction system:
Particulate reduction system that has a gravimetric particulate retention, determined according to number 5 or number 6, of at least 50%. For engines with a displacement of less than 0.75 dm^3 per cylinder and a rated speed of more than 3,000 r.p.m., a particulate retention of at least 30% applies.

Particulate reduction system family:
Family of all particulate reduction systems that are technically identical with respect to functioning according to the harmonisation criteria for system families in number 7.1.

Periodically regenerating particulate reduction system:
Particulate reduction system whereby a recurring periodic regeneration takes place at fewer than 100 engine running hours.

Degree of retention:
Ratio of particulate mass retained by the particulate reduction system to the particulate mass measured in the starting condition of the vehicle in the ESC test cycle for PMK 0 and PMK 1 and in the ETC test cycle for PMK 2 or in the NRSC cycle for PMK 0, PMK 1 and in the NRTC cycle for PMK 2.

Abbreviations

η: Degree of retention

M_{pi} Weighted total emission (g/kWh) for regulated particulate reduction systems

M_{si} Average emissions measured over several cycles without regeneration (g/kWh)

M_{ri} Emissions during regeneration

N_g Retrofitted condition

V_F: Volume of the particulate reduction system

V_H: Displacement of the engine

PT: Particulate emission

MGas: Emission of gaseous components

2. Definition of the particulate reduction classes

Commercial vehicles retrofitted with a particulate reduction system are classified as follows provided they meet the requirements, stated for each class, described in Annex XIV.

a) PMK 01, provided they comply with number 3.4.1

b) PMK 0, provided they comply with section 1, 2 or 3 in number 3.4.2

c) PMK 1, provided they comply with section 1, 2 or 3 in number 3.4.3

d) PMK 2, provided they comply with section 1, 2 or 3 in number 3.4.4

e) PMK 3, provided they comply with section 1 in number 3.4.5

f) PMK 4, provided they comply with number 3.4.6

3. Requirements for particulate reduction systems

The applicant shall provide proof of the tests described in numbers 4 and 5 or 6 and confirm that the functional capability of the system is guaranteed during normal operation in

a) commercial vehicles over a mileage of 80,000 km for engines with a displacement of less than 0.75 dm^3 per cylinder and a rated speed of more than 3,000 r.p.m, otherwise over a mileage of 200,000 km or a service life of up to 6 years, depending on which criterion is first reached,

b) mobile machines or units over 4000 operating hours or a service life of up to 6 years, depending on which criterion is first reached.

The particulate reduction systems shall not be fitted with devices that render these systems inoperative; otherwise the requirements of number 3.2 apply.

3.1 Compliance criteria

The particulate reduction system shall not deviate with respect to the following features:

a) Type of retention and functioning of reduction material (metal, ceramic).

b) Reduction design of filter material (sheets/plates, braid, wound, cell/material/non-woven density, porosity, pore diameter, number of pockets/blades/balls, surface roughness, diameter of wire/balls/fibre).

c) Minimum thickness of the coating of the particulate reduction system or upstream catalysers (g/ft^3)

d) Canning/packaging (storage/retention of carrier)

e) Volume ± 30%

f) Type of regeneration (periodic or continuous)

g) Regeneration strategy (catalytic, thermal, electrothermal regeneration)

h) Method of applying additives /dosing system (if used))

i) Type of additive (if used)

j) Introduction conditions (max. + 0.5 m introduction difference between the turbocharger outlet (turbine) and the inlet of the particulate reduction system)

k) With or without upstream oxidation catalyser

Further use of the existing oxidation catalyser(s):

Oxidation catalysers upstream of the reduction system can continue to be used in individual cases after retrofitting, provided these are shown to be:

a) not more than 5 years old,

b) have been installed in the vehicle for not more than 80,000 km in the case of engines with a displacement of 0.75 dm^3 per cylinder and a rated speed of more than 3,000 r.p.m, otherwise not longer than 150,000 km (proof of mileage by means of service log and odometer) and

c) have no visible defects or

d) the manufacturer of the particulate reduction system verifies, as part of the operating permit required under number 8 that the relevant required limits can also be complied with without the standard production oxidation catalyser(s) (the operating permit must contain proof)

If none of the aforementioned proofs are shown, the oxidation catalysers must be replaced by new catalysers before retrofitting with the particulate reduction system.

To test the particulate reduction system on an engine test stand, the system must be fitted so that it has a distance of at least 2 m from the outlet of the turbocharger (turbine). If the applicant can show that a distance shorter than the maximum distance is used within his subsequent application areas, the length of the pipe can be correspondingly reduced. Insulation or similar means are permissible only if they are also used during the subsequent operation of the vehicle.

3.2 Active devices

If devices are present in or fitted to the particulate reduction system that under certain condition mean that certain limits cannot be complied with by the system according to number 2, the applicant shall then demonstrate

a) the conditions under which such devices are activated/deactivated,

b) that they are used only for the protection of the particulate reduction system or the engine or for the regeneration of the particulate reduction system and are not permanently activated,

c) that after an activation the device is deactivated not later than after two test cycles specified for the system according to number 2, in such a way that the original condition is restored. Verification must be shown in an endurance run that includes at least 5 activations/deactivations,

e) that the specified endurance criteria are complied with and

f) that the driver is informed of the activation of such a device.

3.3 Fuel

3.3.1 Fuel quality

The measurements for testing the particulate reduction systems are taken using commercial fuels No. 1.1.

3.3.2 Fuel consumption

The maximum specific fuel consumption during the test cycle to be used shall be not more than 4% greater in the retrofitted condition than the specific consumption in the non-retrofitted condition. The measurements for determining the fuel consumption are carried out in parallel with the measurements according to No. 4.1 for continuously regenerating systems or according to No. 6.2.1 for periodically regenerating systems.

4. Test of a particulate reduction system

The test procedure shall be in accordance with the details in Annex I.

For assessment of the particulate reduction system, an endurance run of at least 100 ETC test cycles or 50 NRTC cycles must be carried out to prove the functional capability in subsequent field use. The endurance run is used to verify the functional capability and stability of the system and also its efficiency. The gaseous emissions and the particulate must be measured in at

least each fifth test cycle. The testing of the particulate reduction system is carried out for families with regard to the particular application area, i.e. one system test takes place for each application area.

Furthermore, the endurance run is used to verify whether it is a continuous or periodically regenerating particulate reduction system.

If the applicant can prove that a particulate reduction system tested for vehicles of Category M, except M_1 or Category N, is designed for use in the same structural manner on spontaneous-ignition ignition engines for use in mobile machines and units and the family of test engines according to 4.2 is representative for such applications and also meets the compliance criteria of 7.1.2, the application area can also be extended to spontaneous-ignition engines for use in mobile machines and units. A reverse extension is not possible.

4.1 Verification of continuous regeneration

Verification of a continuously operating regeneration process is considered provided if a suitable assessment variable on a particulate reduction system can be regarded as constant over a time period of at least 25 test cycles. The particulate emission and the exhaust gas backpressure can be regarded as suitable assessment variables. These variables are considered constant within the meaning of this test specification where there is a variance of less than 15% over 25 test cycles. The exhaust gas backpressure is measured continuously and the particulate emissions are measured during at least every fifth test cycle.

The variance is calculated as follows.

$$\text{Variance} = \frac{\text{Standard deviation X (n)}}{\text{Average value X (n)}}$$

where:

$$\text{Standard deviation} = \sqrt{\frac{n\,\Sigma x^2 - (\Sigma x)^2}{n^2}}$$

and:

$$\text{Average value} = (x_1 + x_2 + \ldots + x_n) / n$$

where:
n = number of measured values
x = respective single measured value

4.2 Choice of family of test engines

The engine chosen for testing should originate from a family of engines corresponding to the subsequent application area.

The test engine for the selected application area shall meet the following criteria.

- 100% to 60% power of the basic engine in the application area (basic engine of an engine family according to Annex 1. No. 8.2 or Annex 1 No. 7 of the directives named in number 7.1.2.
- smallest used filter volume (V_{FI}) corresponding to subsequent use for the selected test engine.

In all cases, the adapted ESC test cycle according to Annex V, and for PMK 2 also the ETC test cycle, are to be used as the test cycle for exhaust gas measurement on commercial vehicle engines on the engine test stand. For engines for mobile machines and units, the NRTSC cycle is to be used for PMK 0 and PMK 1 and the NRTC cycle for PMK 2. The gaseous emissions and particulate emissions are to be measured during at least every fifth test cycle during the measurements for verification of the regeneration characteristic.

4.3 Test of the regeneration characteristic for unregulated systems.

Unregulated particulate systems according to No. 1.2 are to be subjected to a further test for verification of the regeneration characteristic.

This test is carried out by loading the system until a constant exhaust gas backpressure is reached or over a time period of a maximum of 100 h. The exhaust gas backpressure is considered constant if not earlier than after 50 h the exhaust gas backpressure is within a range of 4 mbar within a period of 30 min. The test points of the loading cycle are to be selected so that the maximum exhaust gas temperature of 180 ^{0}C at the inlet of the particulate reduction

system is not exceeded. The loading is preferably carried out by running up to a constant speed of between 50% and 75% of the rated speed of the test engine.

After the system loading has been reached, or after a maximum of 100 h, a regeneration is activated. This can, for example, be activated by running to test phase 8 in the adapted ESC test cycle according to Annex V. After completion of the regeneration, exhaust gas measurements are to be taken in at least three ESC test cycles according to Annex V and/or three ETC test cycles or three NRSC or NRTC cycles. The measured exhaust gas values shall not deviate from the measured exhaust gas values before the loading endurance run by more than 15% for the gaseous emissions or more than 20% for the emissions of the particulate mass.

The manufacturer shall verify that the maximum temperatures occurring during the regeneration are uncritical.

As an alternative to the loading endurance run, the manufacturer can provide a particulate reduction system already loaded to the limit for the regeneration test.

4.4 Test of the opacity of the smoke in the ELR test cycle.

The opacity of the smoke is to be tested in accordance with the specifications of Annex III Appendix 1 No. 3 in conjunction with No. 6 of Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2006/51/EC of 6 June 2006 (OJ L 152 p.11). The time point at which this test is to be performed is specified in Annex I.

5. Assessment criteria for continuously regenerating particulate reduction systems

The test is carried out in accordance with the specifications of Annex I.

The system test of the particulate reduction system is considered satisfactory if the following criteria are met.

5.1 Degree of retention

Te degree of retention η in the retrofitted condition shall be

a) at least 30% for unregulated systems for engines with a displacement of less than 0.75 dm^3 per cylinder and a rated speed of more than 3,000 r.p.m, otherwise 50%,

b) at least 90% for regulated systems.

5.2 Limited pollutants

The limited pollutants (CO, HC, NO_x) in the initial condition and in the retrofitted condition shall comply with the limit values of the original homologated pollutant class. The NO_2/NOx ratio for the initial condition and retrofitted condition is to be recorded and shown in the test report.
The determination of the NO_2 - and NOx- mass emissions is to be determined by simultaneous measurement. The measurement can be taken by an NO_2 - and NOx analyser respectively or by a combined NO2- /NOx - analyser.

5.3 Opacity of smoke

The opacity of the smoke determined in accordance with Annex III Appendix 1 No. 3 in conjunction with No. 6 of Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2006/51/EC of 6 June 2006 (OJ L 152 p.11) shall not exceed a value of 0.8 m^{-1} in the initial condition and in the retrofitted condition.

6. Assessment criteria for periodically regenerating particulate reduction systems

The test procedure shall be in accordance with the specifications of Annex I. The system test of the particulate reduction system is considered passed if the following criteria is met.

The particulate emissions for periodically regenerating systems are determined as follows .

$$PT = (n1 \times PT,n1 + n2 \times PT,n2) / (n1 + n2)$$

where:

n1 = Number of adapted ESC test cycles according to Annex V (PMK 0, PMK 1) / ETC test cycle (PMK2, PMK 4) between two regenerations.

n2 = Number of adapted ESC test cycles according to Annex V (PMK 0, PMK 1) / ETC test cycle (PMK2, PMK 4) during the regeneration (minimum of 1 test cycle in each case).

PT,n1 = Emission during the loading (arithmetical average value of the measurements at the beginning of the loading and the measurements at the end of the loading; several measurements are also permissible).

PT,n2 = Emission during the regeneration.

For a periodically regenerating exhaust gas treatment, the emissions must be determined in at least three adapted ESC test cycles according to Annex V (once at the start, once at the end of the loading and once during the regeneration). The regeneration process must occur at least once during an adapted ESC test cycle according to Annex V. The measurements can be taken in the endurance run according to No. 4.1.

If more than two measurements between the regeneration phases are used to determine the emissions, these further measurements must be taken at equal intervals and an arithmetical average taken.

The manufacturer shall state the conditions (loading, temperature, backpressure, time duration etc) under which the regeneration normally occurs. For measurements during the regeneration, the applicant can provide a system loaded to its limit for the measurement.

The respective limit values to be used shall not be exceeded during the regeneration phases.

6.1 Degree of retention

The degree of retention η in the retrofitted condition shall be

a) at least 30% for unregulated systems for engines with a displacement of less than 0.75 dm^3 per cylinder and a rated speed of more than 3,000 r.p.m, otherwise 50%,

b) at least 90% for regulated systems.

6.2 Limited pollutants

The limited pollutants (CO, HC, NO_x), using the calculation in No. 6.2.1, shall comply with the limits of the original homologated pollutant class in the initial condition and in the retrofitted condition. The NO_2 / NOx ratio is to be recorded for the initial and retrofitted conditions according to No. 5.2 and given in the test report.

6.2.1 Weighted gaseous emissions

The emission of gaseous components for periodically regenerating systems is determined as follows.

$$MGas = (n1 \times MGas,n1 + n2 \times MGas,n2) / (n1 + n2)$$

where:

n1 = the number of adapted ESC test cycles according to Annex V (PMK 0, PMK 1) / ETC test cycle (PMK2) between two regenerations

n2 = the number of adapted ESC test cycles according to Annex V (PMK 0, PMK 1) / ETC test cycle (PMK2) during the regeneration (minimum one test cycle in each case)

Mgas,n1 = the emission during loading (arithmetical average from the measurement at the start of loading and the measurement at the end of loading; several measurements are also permissible)

Mgas,n2 = the emission during the regeneration

6.3 Smoke opacity

The smoke opacity determined according to Annex III Appendix 1 No. 3 in conjunction with No. 6 of Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Directive 2006/51/EC of the Commission dated 6 June 2006 (OJ L 152 p.11) in the initial condition and in the retrofitted condition shall not exceed 0.8 m^{-1} .

7. Requirements for particulate reduction systems for forming a system family

System families can be formed from particulate reduction systems of different sizes (volumes) provided the compliance criteria according to No. 7.1 are met.

7.1 Compliance criteria for system families

7.1.1 For the specification of the application area of a particulate reduction system of the same construction with different volumes for various engines and vehicle types, the test carriers shall not differ with respect to the features according to No. 3. The limit of the application area of a system is determined for each engine or vehicle manufacturer by testing a test engine on the engine test stand in accordance with No. 4.2.

7.1.2 The application area of a particulate reduction system family includes an engine family of an engine manufacturer covered by the respective test engine according to No. 4.2, in accordance with Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2006/51/EC of 6 June 2006 (OJ L 152 p. 11) or of Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 (OJ 1998 No. L 59 p. 1) as amended by Directive 2004/26/EC of the European Parliament and of the Council of 21 April 2004 (OJ L 225 p. 3). If the applicant can show that other engine families of a manufacturer, or other engine families of other manufacturers of the applicant area covered by the test engine are identical with respect to the family formation criteria, the application area can be extended to these engine families. The family formation criteria for the extension of the application area is ± 15% of the displacement of a single cylinder and the method of aspiration (turbo engine/normally-aspirated engine).

7.2 Requirements for the test engine

The test engine in the series production condition and in the retrofitted condition must comply with the values of the original homologated limit value stage for all limited emissions.

The modification on the test engine must comply with the subsequent series condition of the modification applied for.

Vehicles with on-board diagnosis shall not be limited with respect to their monitoring function after the retrofit system has been installed. The electronic engine control unit (e.g. for injection, air-mass meter, exhaust gas reduction) shall not be altered by the retrofitting. If the test engine does not have AGR, the

application area can then be extended to engines with AGR only if the applicant can show that the particulate reduction system has no negative effect on the limited gaseous polluting components. No proof is necessary if a suitable release from the engine manufacturer is present.

7.3 Test and measuring procedure on the engine test stand

The test procedure for unregulated and regulated particulate reduction systems is given in Annex I.

7.4 Assessment of the particulate reduction systems for the application area within an engine/vehicle family.

The test of a particulate reduction system for the application areas is regarded as passed if the following criteria are complied with.

7.4.1 Particulate emission

The particulate emission in the retrofitted condition shall be less than the limit value of the corresponding reduction stage PMK 0, PMK 1 or PMK 2.

7.4.2 Degree of retention

The degree of retention η in the retrofitted condition shall be

a) at least 30% for unregulated systems for engines with a displacement of less than 0.75 dm^3 per cylinder and a rated speed of more than 3,000 r.p.m, otherwise 50%.

b) at least 90% for regulated systems

7.4.3 Opacity of smoke

The opacity of the smoke determined in accordance with Annex III Appendix 1 No. 3 in conjunction with No. 6 of Directive 2005/55/EC of the European

Parliament and of the Council of 28 September 2005 (OJ L 275 p. 1) as amended by Commission Directive 2006/51/EC of 6 June 2006 (OJ L 152 p.11) shall not exceed a value of 0.8 m^{-1} in the initial condition and in the retrofitted condition.

7.4.4 Limited gaseous components

The limited gaseous components in the series production condition and in the retrofitted condition shall be less than the limit values of the original homologated pollutant class.

8. Approval

If due to the installation of particulate reduction systems the emissions of air polluting particulate from motor vehicles already licensed for road use is reduced,

a) an operating permit for vehicle components according to Section 22 or

b) approval as part of an operating permit for the vehicle according to Section 21

is required for the particulate reduction system.

In the case of a), the operating permit for the particulate reduction system must show compliance with one of the particulate reduction classes PMK 0, PMK 1 or PMK 2 according to the specifications of this Annex. Details regarding the use of the particulate reduction system and of the installation are given in the operating permit.

In the case of b), the officially-approved specialist appointed to perform the assessment shall determine whether the motor vehicle satisfies the requirements of particulate reduction class PMK 0, PMK 1 or PMK 2. He shall furthermore, in accordance with his duty assess, and if necessary confirm by means of a certificate in accordance with Annex II, that it is not anticipated that the exhaust gas characteristics of the vehicle will essentially deteriorate, when correctly operated, during the running time specified in No. 3..

9. Approval authority

9.1 The approval authority within the meaning of this Annex is the Kraftfahrt-Bundesamt, Fördestraße 16, 24944 Flensburg. This does not apply to the procedure according to Section 21.

9.2 Particulate reduction systems from other member states of the European Community or of Turkey or of an EFTA state that are contracting parties of the EEC agreement are approved for retrofitting to motor vehicles with diesel engines provided the same level for particulate reduction is guaranteed as is contained in this Annex.

10. Withdrawal of approval

An approval is withdrawn if it is found that the conditions for the approval are no longer present or complied with or the holder of the approval has grossly infringed the obligations arising from the approval.

11. Additional requirements

11.1 Operating behaviour

No impairment of the operating behaviour and no additional danger to vehicle safety shall arise due to the installation of the particulate reduction system.

11.2 Noise

The applicant shall prove that the retrofitting of a particulate reduction system will not lead to a deterioration in the noise characteristic. Noise measurement can be omitted for particulate reduction systems fitted in addition to the series production silencer system.

11.3 Use of additives

In the case of a particulate reduction system supported by an additive, a certificate of clearance from the environment office with respect to the system in conjunction with the additive used is to be submitted to the centre commissioned to perform the assessment.

11.4. Electromagnetic compatibility

If electronic components or control units are used, they shall comply with the requirements of Section 55a.

12. Installation and acceptance of a retrofit with an approved particulate reduction system

12.1 Installation

12.1.1 Retrofitting with an approved particulate reduction system is to be carried out by an AU vehicle workshop approved for performing exhaust gas analysis on motor vehicles with compression-ignition engines according to Annex VIIIc No. 1 in conjunction with Annex VIIIa No. 3.1.1.1. In deviation from sentence 1, retrofitting can also be performed by a different body. In this case, No. 12.2b applies.

12.1.2 The motor vehicle to be retrofitted must be in a technically serviceable condition. Defects that could impair the achievement of the particulate reduction verified by the operating permit of the particulate reduction system or adversely affect the endurance are to be rectified as necessary before the retrofitting.

12.2 Acceptance

The correct installation of all parts and the proper functioning of the particulate reduction system are to be confirmed

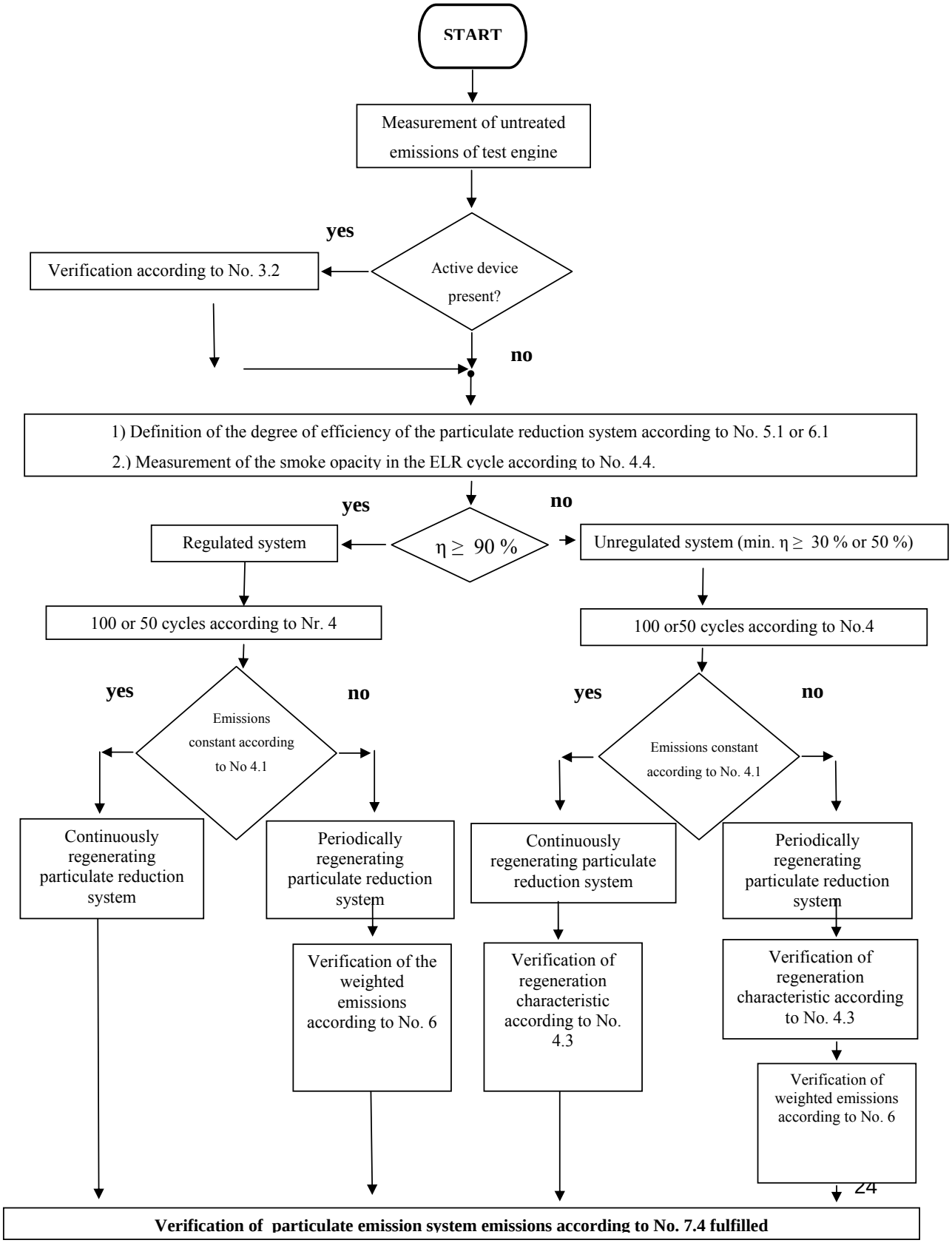
a. by the approved AU motor vehicle workshop, if this workshop has itself carried out the retrofitting, by means of an acceptance certificate for

particulate reduction systems corresponding to Annex IV, for submission to the approval authority or

b. by an officially approved expert or tester for motor vehicle traffic or by a motor vehicle expert or an employee in accordance with the specifications of Annex VIIIb by means of an acceptance certificate according to Annex IV.

Annex I

Overview of test sequence (Re. No.4, 5 or 6)



Annex II

(Re. No. 8b)

Certification for Section 21 operating permit for individual vehicles according to Annex XXVII

Vehicle manufacturer:

Vehicle identification number:

1 Type Code number	2 Emissions code number	3 Approval of particulate reduction system	4 Entry of particulate reduction class

It is certified that the vehicle/or vehicles described above complies/comply with the requirements of the particulate reduction class entered in column 4 according to Annex XIV of Section 48 in conjunction with Annex XXVII and may be marked in the vehicle documents in the "Remarks" field corresponding to the specifications of Annex V.

Documents used for the actual assessments, such as certificates according to Annex IV or general operating permits according to Section 22 are to be stated.

It is not anticipated that the exhaust gas behaviour of the vehicle will substantially deteriorate during correct operation over a period of up to 5 years or up to a mileage of 80,000 km for engines with a displacement of less than 0.75 dm^3 per cylinder and a rated speed of more than 3,000 r.p.m. , otherwise of 200,000 km, depending on which criterion is first achieved.

Technical Service: ……

Date , signature: ……..

Annex III

(Re No. 3 and 8a)

Application for the issue of an operating permit for vehicle components for particulate reduction systems and required documents, according to Section 22

1. A formless application for the issue of a general operating permit for a particulate reduction system is to be made to the approval authority.

2. The applicant must meet the legal administrative and technical requirements for the issue of a general operating permit according to Section 20 StVZO in conjunction with Section 22 StVZO and submit the required documents as specified by the approval authority.

3. The basis for the issue is the technical report by the accredited technical service, in which the particulate reduction system is described and the test to be carried out according to Annex XXVII are documented and that verifies that the relevant specifications of Annex XXVII are complied with.

4. In the approval process, an approved type of particulate reduction system with respect to the shape and dimension of the carrier is specified. Subsequently changes to the carrier length or cross section are possible as part of an expansion with the maximum deviations of up to ± 10% . The maximum increase in volume due to these changes is 10%. A reduction in the original volume is not permitted.

Annex IV

(Re. No. 12.2)

Acceptance certification
for the correct installation of an approved particulate reduction system for submission to the approval authority

1. Confirmation of correct installation

1.1 The technically correct condition of the vehicle has been determined/established *) before installation of the particulate reduction system.

1.2 The vehicle described under number 2 was fitted with a particulate reduction system named under number 3. The correct installation of all parts and the proper functioning of the particulate reduction system are hereby confirmed.

1.3 Renewal of the fitted oxidation catalyser was

- not necessary *)
- necessary and has been performed *)

2. Details of motor vehicle

2.1 License number:

2.2 Name and address of vehicle keeper:

2.3 Vehicle manufacturer:

2.4 Type:

2.5 Vehicle identification number:

2.6 Data of first approval:

2.7 Odometer reading:

3. Details of particulate reduction system (PMS)

3.1 Manufacturer of particulate reduction system:

3.2 Type/make:

3.3 Approval number:

3.3.1 Print of the ABE for the particulate reduction system according to Section 22 StVZO *),

3.3.2 Print of the ABE according to Section 21 StVZO for the individual vehicle *)

4. Details of vehicle documents:

4.1 Due to the fitting with the particulate reduction system described in No. 3, the motor vehicle meets the requirements of the following particulate reduction classes and is to be marked as follows in the "Remarks" field in the vehicle documents.:

- "PMK 0 followed by type: (enter); KBA (enter No.), from (date)" *)
- "PMK 1 followed by type: (enter); KBA (enter No.), from (date)" *)
- "PMK 2 followed by type: (enter); KBA (enter No.),from (date)" *)

Centre completing the documentation: (name, address, control number of approved AU workshop)

Place, date, signature of the person responsible for analyzing the exhaust gas in accordance with Section 29 paragraph 12 or Section 47a paragraph 3 StVZO.

*) Delete if not applicable.

Annex V

(Re. No. 4.2, 4.3 or 6)

Adapted ESC cycle

1. ESC cycle for determining the particulate emissions for periodically regenerating systems.

1.1 An ESC cycle with the following stage times and collective times.

Test phase	Engine speed	Part load ratio	Duration of test phase	Particulate reduction collective time
1	Idling	-	*240 sec*	210 sec
2	A	100	*120 sec*	90 sec
3	B	50	*120 sec*	90 sec
4	B	75	*120 sec*	90 sec
5	A	50	*120 sec*	90 sec
6	A	75	*120 sec*	90 sec
7	A	25	*120 sec*	90 sec
8	B	100	*120 sec*	90 sec
9	B	25	*120 sec*	90 sec
10	C	100	*120 sec*	90 sec
11	C	25	*120 sec*	90 sec
12	C	75	*120 sec*	90 sec
13	C	50	*120 sec*	90 sec

1.2 The determination of the effective weighting factors is omitted when assessing periodically regenerating systems according to 6.

Draft

(Version: 26.10.2006)

Grounds

for [30.] Order for the Amendment of the Automobile Safety Act

of …… 2006

I. General

The method for reducing particulate emissions from passenger cars with diesel engines decided upon when the 29th Order for the Amendment of the Automobile Safety Act of 27 January 2006 (Federal Law Gazette I p.287) came into force is further extended by means of this order. This time, the focus is on the reduction of particulate emissions from commercial vehicles and from mobile machines and units powered by diesel engines. Furthermore, the resolution by the Federal Council with respect to passenger cars that comply with the requirements of exhaust gas stage Euro I (Publication 812/05 (Resolution)), is taken into account. Overall this complies with the decision (Publication 162/06 (Resolution)) reached by the Federal Council under B No. 2.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

For legal EC reasons, the measures for a further reduction in the particulate emissions is also to be implemented only on a voluntary basis. By means of the order, "Emission Classes for Motor Vehicles" in accordance with Section 48 of the Automobile Safety Act, "Particulate Reduction Classes" was inserted in Annex XIV and a total of six particulate reduction classes (PMK 01 – PMK 4)were defined. This is necessary in order to ensure a correct assignment of commercial vehicles and of mobile machines and units in line with the pollutant classes.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

In order to be able to suitably meet the requirements of the "Euro -1 – Pkw") (Euro – 1 – passenger car) including those of heavy passenger cars of groups II and III, it was necessary to define two new reduction stages (stage PM 01 and Stage PM O) and place them before stage PM 1 in Annex XXVI that had already been in force since

February 2006. A comparable solution for the corresponding, light commercial vehicles is provided by the particulate reduction classes PMK 01 and PMK 0.

For the specification of the individual technical requirements that heavy commercial vehicles and mobile machines and units, and the particulate reduction systems (e.g. particulate filters) developed for retrofitting, must comply with, a new Annex XXVII is added. This also contains requirements with regard to the durability and cleaning effect of the particulate reduction systems to be used.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

The requirements of Annex XXVI can henceforth also be applied as appropriate for light commercial vehicles of category N_1 that come within the application area of Section 47 paragraph 1. Furthermore, the extension of the application range of approved particulate reduction systems for passenger cars or mobile homes to the corresponding commercial vehicles is also permitted. The costs for the development and approval of a particulate reduction system relative to the individual vehicle can thus be reduced.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

The order thus creates further legal transport preconditions and opportunities to which reference can be made in other acts or orders for granting user advantages, such as a reduction in vehicle tax, regulations for the specification of tolls or exceptions from driving prohibitions in certain zones. The order contributes to a rapid market penetration with corresponding commercial vehicles.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

Financial effects on the public authorities budgets:

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

No budgetary expenditure arises without enforcement expense.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

Budgetary expenditure with enforcement expense: costs may arise for the Kraftfahrt-Bundesamt (Federal Office for Motor Traffic) and for the traffic authorities of the German states but the amount cannot be quantified. The additional expenditure by the Federal Office for Motor Traffic and any additional requirement for planning offices/centres are covered in Departmental Budget Plan 12 . For local authorities there is no budgetary expenditure with an enforcement expense.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

There may be additional costs to the economy, particularly to medium-sized companies. Whether because of the regulations, the cost thresholds for unit prices are exceeded for those to whom the regulations apply, so as to have the effect of raising their offer prices, and whether those to whom the regulations apply exhaust their possibilities of passing on this cost increase depending on the actual competition in their market segments, cannot of course be estimated but equally cannot be ruled out. Furthermore, the possible changes in unit prices might not be sufficient because of their weighting (lower risk factor in the relevant price indices) to have a direct effect on the general price or consumer price level. The additional cost to the public authorities budgets due to the increased enforcement expenditure requires no reciprocal financing that directly affects prices..

II. Re. Individual provisions

1. Re. Introductory sentence

The Order is to be decreed in accordance with Section 6 paragraph 2a of the Road Traffic Act and in accordance with Section 38 paragraph 2 of the Federal Air Pollution Control Act, of the Federal Ministry for Transport Building and Urban Development and of the Federal Ministry for the Environment, Nature, Preservation and Reactor Safety.

2. Re. Section 1

2.1 Re. Section 1 No. 1 (content overview)

Expansion of the content overview by the header of the new Annex XXVII.

2.2 Re. Section 1 No. 2 (Sect. 48)

The change and extension of Section 48 is necessary to link appendices that specify the retrofitting of commercial vehicles or mobile machines or units powered by spontaneous-ignition engines, that apply particularly to Annex XXVII, with the regulatory element of StVZO. This is indicated for systematic legal reasons.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

2.3 Re. Section 1 No. 3 (Annex XIV)

a) The term particulate reduction classes is adopted in the definition of terms and the definitive basis for same is given.

b) A total of six particulate reduction classes (PMK) are defined.

PMK 01 is essentially designed for the retrofitting of light commercial vehicles of groups II and III, that comply with the corresponding pollutant limits of the "Euro 1" exhaust gas stage with a limit of 0.220 or 0.290 g/km for the particulate mass. They must comply with the limit value of 0.170 g/km, called the "Euro 2" exhaust gas stage, applicable to group III light commercial vehicles, after retrofitting. PMK 01 applies to light commercial vehicles that are identified in the vehicle documents with the emission-relevant codes 40, 41, 42, 50, 51 of 52; or 0640, 0641, 0642, 0650, or 0652.

PMK 0 is mainly intended for the retrofitting light commercial vehicles of the group I, "Euro 1" exhaust gas stage with a limit value of 0.180 g/km for the particulate mass and of groups II and III "Euro 2" exhaust gas stage with a limit value of 0.120 or 0.170 g/km for the particulate mass. After retrofitting, they must comply with the limit value of 0.100 g/km, the "Euro 3" exhaust gas stage, with respect to the particulate mass for light commercial vehicles of group III. PMK 0 applies to light commercial vehicles that are marked in the vehicle documents with the emission-related codes 30, 31,32, 43 or 53;or 0630, 0631, 0632, 0643 or 0653.

PMK 0 is also designed for the retrofitting of heavy commercial vehicles including articulated vehicles, urban omnibuses and heavy mobile homes, and also mobile machines and units that are assigned to pollutant class S1 or exhaust gas stage "Euro 1". After retrofitting, they must comply with the particulate level of 0.150 g/kWh for motor vehicles assigned to pollutant class S2 or exhaust gas stage "Euro II". PMK 0 also applies to motor vehicles that are marked in the vehicle documents with the emission-related codes 10, 11 or 12; or 0610, 0611 or 0612.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

PMK 1 and PMK 2 are also designed for the retrofitting of heavy commercial vehicles including commercial vehicles, urban omnibuses and heavy mobile homes, and also mobile machines and units.

In this case, PMK 1 is preferably to be applied to motor vehicles that are assigned to pollutant class S2 or exhaust gas stage "Euro II". After retrofitting, they must comply with the limits, 0.100 g/kWh in the ESC cycle with respect to the particulate mass for motor vehicles assigned to pollutant class S3 or exhaust gas stage "Euro III". PMK 1 is preferably designed for motor vehicles that are identified in the vehicle documents with the emission-related codes 20, 21 or 22; or 0620, 0621 or 0622.

PMK 2 is in this case preferably to be applied to motor vehicles that are assigned to pollutant class S3 or exhaust gas stage "Euro III". After retrofitting, they must comply with the limit value, 0.020 g/kWh in the ESC and 0.030 g/kWh in the ETC cycle, for the particulate mass of motor vehicles assigned to pollutant class S4 or exhaust gas stage "Euro IV". PMK 2 is preferably designed for motor vehicles that are marked in the vehicle documents with the emission-related codes 70 or 71; or 0670 or 0671.

No further particulate reduction classes are envisaged for this motor vehicle group. The limit for the particulate mass for the exhaust gas stages "Euro IV" and "Euro V" already specified is identical. Exhaust gas stage "Euro V" does not come into effect until 2009 or 2010.

The requirements of the particulate reduction classes PMK 1 to PMK 4 applicable to light commercial vehicles agree with those of particulate reduction stages PM 1 to PM 4 for passenger cars.

PMK 1 is preferably designed for light commercial vehicles that are marked in the vehicle documents with the emission-related codes 33, 44, 54, 60 or 61; or 0633, 0644, 0654, 0660, or 0661;

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

PMK 2 is preferably designed for those marked in the vehicle documents with the emission-related codes 34, 45 or 55; or 0634, 0634, 0645 or 0655;

PMK 3 is preferably designed for those marked in the vehicle documents with the emission-related code 35 or 0635 and

PMK 4 is especially designed for those marked in the vehicle documents with the emission-related codes 35, 45, or 55;or 0635, 0645 or 0655.

2.4 Re. Section 1 No. 4 (Annex XXVI)

a) Amendment of the contents list as a consequence of the introduced particulate reduction stages.

b) With the introduced opening clause, the same requirements apply for light commercial vehicles as for passenger cars with the same exhaust gas characteristic. The possibility of extending the application area of particulate reduction systems already approved for passenger cars to corresponding commercial vehicles reduces the overall cost for the required approvals. The cost for development and approval of a particulate emission system can also be spread over a greater number of retrofittable motor vehicles.

c) The newly established particulate reduction stages PM 01 and PM 0 comply with the requirement of the Federal Council for appropriate allowance of Euro-1 passenger cars (see 1 General). The same applies, as has already been stated, for the particulate reduction classes PMK 01 and PMK 0 in relation to light commercial vehicles.

Stage PM 01 is designed mainly for the retrofitting of passenger cars of groups II and III that are marked in the vehicle documents with the emission-related codes 19, 20, 23 or 24; or 0419, 0420, 0423 or 0424.

Stage PM 0 is mainly designed for the retrofitting of conventional “Euro-1 passenger cars“ and passenger cars of groups II and III in accordance with exhaust gas stage Euro 2 that are similar with respect to their exhaust gas characteristic, that are marked in the vehicle documents with the emission-related codes 14, 16,

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

18, 21, 22, 28, 29, 34, 40 or 77; or 0414, 0416, 0418, 0421, 0422, 0428, 0429, 0434, 0440 or 0477.

d) The changes made under d) to j) are subsequent editorial changes necessary because of the new particulate reduction stages set for PM 01 and PM 0 or the changes to the summary of the main and exhaust gas analysis introduced by the 41 Order to amend the road traffic regulations of 03.03.2006 (Federal Law Gazette I p.470).

2.5 Re. Section 1 No. 5 (Annex XXVII)

The technical requirements and administrative regulations applicable to particulate reduction systems that are designed for retrofitting to commercial vehicles, heavy mobile homes or mobile machines or units and that are powered by engines that comply with the requirements of Directive 88/77/EEC or its Successor Directive 2005/55/EC or of Directive 97/68/EC, are summarized in the new Annex XXVII.

Six particulate reduction classes (PMK) in total have been defined for commercial vehicles, heavy mobile homes or mobile machines and units. As yet, however, the requirements for particulate reduction systems according to Annex XXVII are relevant only for particulate reduction classes PMK 0, PMK 1 and PMK 2. Corresponding approved particulate reduction systems are provided for retrofitting motor vehicles that belong to pollutant class S1, S2 or S3.

The efficiency of particulate reduction systems is basically and essentially determined by their ability to regenerate. The test sequence for particulate reduction systems that are developed for conventional retrofitting of commercial vehicles, heavy mobile homes or mobile machines and units is therefore initially chosen so that the system is tested with respect to its functioning and efficiency in the ETC or NRTC cycle. To be able to check the regeneration characteristic of unregulated systems, a further test by means of a system loading and an initiation of the regeneration is specified. Refer to the relevant grounds, applicable to “Passenger car particulate reduction systems” of Annex XXVI.

Formatted: Font: Times New Roman, Underline, Font color: Blue, English (U.K.)

To limit the number of expensive tests, the specifications for forming system families is formulated so that a substantial part of the available retrofitting potential can be covered by not more than 1 to 3 certifications.

An operating permit for vehicle components according to Section 22 StVZO is specified as a mandatory requirement for particulate reduction systems intended for retrofitting. This is designed to ensure a high quality standard. Refer also in this case to the corresponding Grounds of Annex XXVI

Vehicles fitted with particulate reduction systems should be identified by a suitable verification by means of an entry in the "Remarks" field in number 33 (old) or number 22 (new) of the vehicle documents (e.g. "PMK1 followed by Type:….:KBA….from (date)").

3. Re. Section 2 (Entry into force)

The coming into force of the Order is regulated by Section 2.

Formatted: Font: Times New Roman, English (U.K.)