

Directive 2000/25/EC of the European Parliament and of the Council of 22 May 2000 on action to be taken against the emission of gaseous and particulate pollutants by engines intended to power agricultural or forestry tractors and amending Council Directive 74/150/EEC (repealed)

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ANNEX I

REQUIREMENTS FOR EC TYPE-APPROVAL OF A TYPE OF ENGINE OR ENGINE FAMILY FOR A TRACTOR AS A SEPARATE TECHNICAL UNIT IN TERMS OF THE POLLUTANTS EMITTED

0. GENERAL

Unless otherwise defined by this Directive, the appropriate definitions, symbols and abbreviations contained in Directive 97/68/EC are applicable.

1. DEFINITIONS

- ‘type of tractor engine in terms of pollutants emitted’ means compression-ignition engines which display no essential differences with regard to the characteristics defined in Appendix 1 to Annex I,
- ‘pollutants emitted’ means gaseous pollutants (carbon monoxide, hydrocarbons, and nitrogen oxides) and polluting particulates.

2. APPLICATION FOR EC TYPE-APPROVAL FOR A TYPE OF ENGINE OR ENGINE FAMILY AS A SEPARATE TECHNICAL UNIT

- 2.1. The application for the type-approval of an engine type or family in terms of the pollutants emitted shall be made by the engine manufacturer or his agent.
- 2.2. It shall be accompanied by the information document, completed in triplicate, a specimen for which is provided in Appendix 1 to this Annex.
- 2.3. An engine conforming to the ‘engine type’ or ‘parent engine’ characteristics described in Appendix 1 to this Annex shall be submitted to the technical service responsible for conducting the approval tests.
- 2.4. In the case of an applicant for type-approval of an engine family, if the approval authority determines that, with regard to the selected parent engine, the submitted application does not fully represent the engine family described in Annex II, Appendix 2, to Directive 97/68/EC an alternative and, if necessary an additional parent engine which is determined by the approval authority shall be provided for approval according to Article 3(1) of Directive 97/68/EC.

3. SPECIFICATIONS AND TESTS

The provisions of Directive 97/68/EC, Annex I, Section 4 and Annexes III, IV and V are applicable.

4. TYPE-APPROVAL FOR A SEPARATE TECHNICAL UNIT

An EC type-approval certificate conforming to the specimen provided in Appendix 2 to this Annex shall be issued.

5. ENGINE MARKING

The engine shall be marked in accordance with the requirements of Appendix 3 to this Annex. The identification number must comply with the provisions of Appendices 4 and 5 to this Annex.

6. CONFORMITY OF PRODUCTION

Without prejudice to the requirements of Article 8 of Directive 74/150/EEC, conformity of production shall be checked in accordance with the provisions of Section 5 of Annex I to Directive 97/68/EC.

7. NOTIFICATION ON THE ISSUE OF APPROVALS

Notice of the approval, extension, refusal or withdrawal of approval or of production definitely discontinued in relation to an engine type pursuant to Annex I or a tractor type pursuant to Annex II must be communicated to the Member States in accordance with Article 5(1) of Directive 74/150/EEC.

8. ENGINE FAMILY

8.1. Parameters defining the engine family

The engine family may be defined by basic design parameters which must be common to all engines within the family. In some cases there may be interaction of parameters. These effects must also be taken into consideration in order to ensure that only engines with similar exhaust-emission characteristics are included within an engine family.

For engines to be considered to belong to the same engine family, the following list of basic parameters must be common.

- 8.1.1. Combustion cycle: 2 stroke/4 stroke⁽¹⁾
- 8.1.2. Cooling medium: air/water/oil⁽¹⁾
- 8.1.3. Individual cylinder displacement
 - engines to be within a total spread of 15 %
 - number of cylinders for engines with after-treatment device
- 8.1.4. Method of air aspiration: naturally aspirated/pressure charged⁽¹⁾
- 8.1.5. Combustion chamber type/design
 - pre-chamber
 - swirl chamber
 - open chamber
- 8.1.6. Valve and porting — configuration, size and number
 - cylinder head
 - cylinder wall
 - crankcase
- 8.1.7. Fuel system
 - pump-line-injector
 - in-line pump
 - distributor pump
 - single element
 - unit injector
- 8.1.8. Exhaust gas recirculation
- 8.1.9. Water injection/emulsion⁽¹⁾
- 8.1.10. Air injection
- 8.1.11. Charge cooling system
- 8.1.12. Oxidation catalyst

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8.1.13. Reduction catalyst

8.1.14. Thermal reactor

8.1.15. Particulates trap

8.2. Choice of parent engine

8.2.1. The parent engine of the family shall be selected using the primary criterion of the highest fuel delivery per stroke at the declared maximum torque speed. If two or more engines share this primary criterion, the parent engine shall be selected using the secondary criterion of highest fuel delivery per stroke at rated speed. Under certain circumstances, the approval authority may conclude that the worst-case emission rate of the family can best be characterised by testing a second engine. Thus, the approval authority may select an additional engine for tests based on features which indicate that it may have the highest emission levels of the engines within that family.

8.2.2. If engines within the family incorporate other variable features which could be considered to affect exhaust emissions, these features must also be identified and taken into account in the selection of the parent engine.

[^{F1}Appendix 1]**Information document****concerning the EC type-approval of a parent engine type for use in a tractor as a separate technical unit, in terms of the pollutants emitted**

The information set out below shall be supplied in triplicate and be accompanied by a list of enclosures. Any drawings needed shall be supplied to an appropriate scale and with sufficient details in A4 format or in a folder of this format. Photographs shall, where needed, show sufficient detail.

SECTION 1 GENERAL

1. **Parent engine/engine type** ⁽¹⁾ ⁽³⁾
 - 1.1. Make(s) (trade name of manufacturer):
 - 1.2. Type and commercial description of the parent and (if applicable) of the family of engine(s) ⁽¹⁾:
 - 1.3. Manufacturer's type coding as marked on the engine(s) and method of affixing:
 - 1.3.1. Location, coding and method of affixing of the type engine identification number:
 - 1.3.2. Location and method of affixing of the EC component type-approval mark:
 - 1.4. Name and address of manufacturer:
 - 1.5. Address(es) of assembly plant(s):

SECTION 2 ENGINE TYPE WITHIN THE FAMILY

2. **Essential characteristics of the family's parent engine** ⁽³⁾
 - 2.1. Description of the compression-ignition engine
 - 2.1.1. Manufacturer:
 - 2.1.2. Manufacturer's engine code as affixed to engines:
 - 2.1.3. Cycle: four stroke/two stroke ⁽¹⁾
 - 2.1.4. Bore: mm
 - 2.1.5. Stroke: mm
 - 2.1.6. Number and layout of cylinders:
 - 2.1.7. Swept volume: cm³

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- 2.1.8. Rated speed: r/min
- 2.1.9. Peak-torque speed: r/min
- 2.1.10. Compression ratio (²):
- 2.1.11. Combustion system description:
- 2.1.12. Drawing(s) of combustion chamber and piston crown:
- 2.1.13. Minimum cross-sectional area of inlet and outlet ports:
- 2.1.14. Cooling system
- 2.1.14.1. Coolant
- 2.1.14.1.1. Nature of coolant:
- 2.1.14.1.2. Circulating pump(s): yes/no (¹)
- 2.1.14.1.3. Characteristics or make(s) and type(s) (if applicable):
- 2.1.14.1.4. Drive ratio(s) (if applicable):
- 2.1.14.2. Air
- 2.1.14.2.1. Blower: yes/no (¹)
- 2.1.14.2.2. Characteristics or make(s) and type(s) (if applicable):
- 2.1.14.2.3. Drive ratio(s) (if applicable):
- 2.1.15. Temperature permitted by the manufacturer:
- 2.1.15.1. Liquid cooling: maximum temperature at outlet: K
- 2.1.15.2. Air cooling: reference point:
- Maximum temperature at reference point: K
- 2.1.15.3. Maximum charge air temperature at the intercooler outlet (if applicable): K
- 2.1.15.4. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s): K
- 2.1.15.5. Lubricant temperature: minimum: K maximum: K
- 2.1.16. Pressure charger: yes/no (¹)
- 2.1.16.1. Make:
- 2.1.16.2. Type:
- 2.1.16.3. Description of the system (e.g. maximum charge pressure, waste-gate, if applicable):
- 2.1.16.4. Intercooler: yes/no (¹)
- 2.1.17. Intake system: maximum allowable intake depression at rated engine speed and at 100 % load: kPa
- 2.1.18. Exhaust system: maximum permissible exhaust back pressure at rated engine speed and at 100 % load: kPa

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- 2.2. Additional anti-pollution devices (if any, and if not covered by another heading)
 - Description and/or ⁽¹⁾ diagram(s):
- 2.3. Fuel feed
 - 2.3.1. Feed pump
 - Pressure ⁽²⁾ or characteristic diagram: kPa
 - 2.3.2. Injection system
 - 2.3.2.1. Pump
 - 2.3.2.1.1. Make(s):
 - 2.3.2.1.2. Type(s):
 - 2.3.2.1.3. Delivery: mm³ ⁽²⁾ per stroke or cycle at pump speed of: r/min (rated) and r/min (maximum torque), respectively, or characteristic diagram
 - State which method is used: on engine/on pump bench ⁽¹⁾
 - 2.3.2.1.4. Injection advance
 - 2.3.2.1.4.1. Injection advance curve ⁽²⁾:
 - 2.3.2.1.4.2. Timing ⁽²⁾:
 - 2.3.2.2. Injection piping
 - 2.3.2.2.1. Length: mm
 - 2.3.2.2.2. Internal diameter: mm
 - 2.3.2.3. Injector(s)
 - 2.3.2.3.1. Make(s):
 - 2.3.2.3.2. Type(s):
 - 2.3.2.3.3. Opening pressure ⁽²⁾ or characteristic diagram:
 - 2.3.2.4. Governor
 - 2.3.2.4.1. Make(s):
 - 2.3.2.4.2. Type(s):
 - 2.3.2.4.3. Speed at which cut-off starts under full load ⁽²⁾: r/min
 - 2.3.2.4.4. Maximum no-load speed ⁽²⁾: r/min
 - 2.3.2.4.5. Idling speed ⁽²⁾: r/min
- 2.3.3. Cold-start system
 - 2.3.3.1. Make(s):
 - 2.3.3.2. Type(s):
 - 2.3.3.3. Description:

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- 2.4. Valve timing
 - 2.4.1. Maximum lift and angles of opening and closing in relation to top dead centre or equivalent data:
 - 2.4.2. Reference clearances and/or setting ranges ⁽¹⁾
 - 2.4.3. Variable valve timing system (if applicable and where intake and/or exhaust):
 - 2.4.3.1. Type: continuous or on/off
 - 2.4.3.2. Cam phase shift angle:
- 2.5. Porting configuration
 - 2.5.1. Position, size and number:
- 2.6. Electronic control functions

If the engine features electronically controlled functions, the information concerning their performance must be provided including:

 - 2.6.1. Make:
 - 2.6.2. Type:
 - 2.6.3. Part Number:
 - 2.6.4. Location of engine electronic control unit:
 - 2.6.4.1. What does it sense:
 - 2.6.4.2. What does it control:

SECTION 3 COMPRESSION-IGNITION ENGINE FAMILY

3. **Essential characteristics of the engine family**

- 3.1. List of engine types within a family
 - 3.1.1. Name of engine family:
 - 3.1.2. Specification of engine types within this family:

	Parent engine				
Engine type					
Number of cylinders					
Rated speed (r/min)					
Fuel delivery per stroke (mm ³) at rated speed					
Rated net power (kW)					
Maximum torque speed (r/min)					
Fuel delivery per stroke (mm ³) at maximum torque speed					
Maximum torque (Nm)					
Low idle speed (r/min)					
Cylinder swept volume as % of parent engine					100

SECTION 4 ENGINE TYPE

4. Essential characteristics of the engine type

4.1. Description of the engine

4.1.1. Manufacturer:

4.1.2. Manufacturer's engine code as affixed to engines:

4.1.3. Cycle: four stroke/two stroke⁽¹⁾

4.1.4. Bore: mm

4.1.5. Stroke: mm

4.1.6. Number and arrangement of cylinders:

4.1.7. Swept volume: cm³

4.1.8. Rated speed: r/min

4.1.9. Peak torque speed: r/min

4.1.10. Compression ratio⁽²⁾:

4.1.11. Combustion system:

4.1.12. Drawing(s) of combustion chamber and piston crown:

4.1.13. Minimum cross sectional area of inlet and outlet ports:

4.1.14. Cooling system

4.1.14.1. Coolant

4.1.14.1.1. Nature of coolant:

4.1.14.1.2. Circulating pump(s): yes/no⁽¹⁾

4.1.14.1.3. Characteristics or make(s) and type(s) (if applicable):

4.1.14.1.4. Drive ratio(s) (if applicable):

4.1.14.2. Air

4.1.14.2.1. Blower: yes/no⁽¹⁾

4.1.14.2.2. Characteristics or make(s) and type(s) (if applicable):

4.1.14.2.3. Drive ratio(s) (if applicable):

4.1.15. Temperature permitted by the manufacturer:

4.1.15.1. Liquid cooling: maximum temperature at outlet: K

4.1.15.2. Air cooling: reference point:

Maximum temperature at reference point: K

4.1.15.3. Maximum charge-air temperature at the intercooler outlet (if applicable): K

4.1.15.4. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s): K

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- 4.1.15.5. Lubricant temperature: minimum: K maximum: K
- 4.1.16. Pressure charger: yes/no ⁽¹⁾
- 4.1.16.1. Make:
- 4.1.16.2. Type:
- 4.1.16.3. Description of the system (e.g. maximum charge pressure, waste-gate, if applicable):
- 4.1.16.4. Intercooler: yes/no ⁽¹⁾
- 4.1.17. Intake system: maximum allowable intake depression at rated engine speed and at 100 % load: kPa
- 4.1.18. Exhaust system: maximum permissible exhaust back pressure at rated engine speed and at 100 % load: kPa
- 4.2. Additional anti-pollution devices (if any, and if not covered by another heading)
- Description and/or ⁽¹⁾ diagram(s):
- 4.3. Fuel feed
- 4.3.1. Feed pump
- Pressure ⁽²⁾ or characteristic diagram: kPa
- 4.3.2. Injection system
- 4.3.2.1. Pump
- 4.3.2.1.1. Make(s):
- 4.3.2.1.2. Type(s):
- 4.3.2.1.3. Delivery: mm³ ⁽²⁾ per stroke or cycle at pump speed of: r/min (rated) and r/min (maximum torque) respectively, or characteristic diagram
- State which method used: on engine/on pump bench ⁽¹⁾
- 4.3.2.1.4. Injection advance
- 4.3.2.1.4.1. Injection advance curve ⁽²⁾:
- 4.3.2.1.4.2. Timing ⁽²⁾:
- 4.3.2.2. Injection piping
- 4.3.2.2.1. Length: mm
- 4.3.2.2.2. Internal diameter: mm
- 4.3.2.3. Injector(s)
- 4.3.2.3.1. Make(s):
- 4.3.2.3.2. Type(s):
- 4.3.2.3.3. Opening pressure ⁽²⁾ or characteristic diagram ⁽¹⁾:
- 4.3.2.4. Governor(s)

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- 4.3.2.4.1. Make(s):
- 4.3.2.4.2. Type(s):
- 4.3.2.4.3. Speed at which cut-off starts under full load ⁽²⁾: r/min
- 4.3.2.4.4. Maximum no-load speed ⁽²⁾: r/min
- 4.3.2.4.5. Idling speed ⁽²⁾: r/min
- 4.3.3. Cold-start system
 - 4.3.3.1. Make(s):
 - 4.3.3.2. Type(s):
 - 4.3.3.3. Description:
- 4.4. Valve timing
 - 4.4.1. Maximum lift and opening and closing angles in relation to top dead centre or equivalent data:
 - 4.4.2. Reference clearances and/or setting ranges ⁽¹⁾:
 - 4.4.3. Variable valve timing system (if applicable and where intake and/or exhaust)
 - 4.4.3.1. Type: continuous or on/off
 - 4.4.3.2. Cam phase shift angle:
- 4.5. Porting configuration
 - 4.5.1. Position, size and number:
- 4.6. Electronic command functions

If the engine features electronically controlled functions, information concerning their performance must be provided including:

 - 4.6.1. Make:
 - 4.6.2. Type:
 - 4.6.3. Part number:
 - 4.6.4. Location of engine electronic control unit:
 - 4.6.4.1. What does it sense:
 - 4.6.4.2. What does it control:;

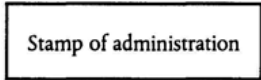
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Appendix 2

SPECIMEN

(Maximum format A4 (210 x 297 mm))

EC TYPE-APPROVAL CERTIFICATE FOR A SEPARATE TECHNICAL UNIT



Communication concerning the

- component type-approval (1)
- extension of component type-approval (1)
- refusal of component type-approval (1)
- withdrawal of component type-approval (1)

pursuant to Directive .../.../EC of a compression-ignition engine type or family as a separate technical unit that is intended to power tractors, in terms of the pollutants emitted.

EC component type-approval No:

Extension No (2):

Reason for extension (2):

SECTION I

- 0. General
0.1. Make (name of undertaking):
0.2. Name and address of the manufacturer (or where appropriate of his agent) of the parent engine type and (where appropriate) of the engine types within the family (1):
0.3. Manufacturer's type coding as marked on the engine(s):
Location:
Method of affixing:
0.4. Location, coding and method of affixing of the type engine identification number:
0.5. Location and method of affixing of the EC component type-approval mark:
0.6. Address(es) of assembly plant(s):

SECTION II

- 1. Restriction on use (if any):
- 1.1. Particular conditions to be met when fitting the engine(s) to the tractor
- 1.1.1. Maximum permissible intake depression: kPa
- 1.1.2. Maximum permissible back pressure: kPa
- 2.1. Technical service responsible for carrying out the type-approval tests:
- 2.2. Date of test report:
- 2.3. Number of test report:

▶⁽¹⁾ 2.4. Test results

Measured in accordance with the requirements of Directive 97/68/EC

CO (g/kWh)	HC (g/kWh)	NO _x (g/kWh)	HC+NO _x (g/kWh)	Particulates (g/kWh)

- 3. The undersigned hereby certifies the accuracy of the manufacturer's description of the engine type/parent engine within the family⁽¹⁾ given above and that the test results set out in the type-approval file are correct.

Component type-approval is granted/refused/withdrawn⁽¹⁾

Place:

Date:

Signature:

Annex:

Component type-approval file:

⁽¹⁾ Delete where appropriate.
⁽²⁾ Specify tolerance.

Appendix 3

Marking of engines

1. Any engine approved as a separate technical unit must bear:
 - 1.1. the trade mark or trade name of the engine's manufacturer;
 - 1.2. the engine type, and if applicable engine family, and a unique engine identification number;
 - 1.3. the EC type-approval mark in accordance with Appendix 5 of this Annex.
2. These marks must last throughout the useful life of the engine and remain clearly legible and indelible. If labels or plates are used, they must be affixed in such a way that they too last throughout the useful life of the engine, and the labels/plates cannot be removed without destroying or defacing them.
3. The marks must be secured to an engine part that is necessary for normal engine operation and not normally requiring replacement during engine life.

These marks must be located so as to be readily visible to the average person once the engine has been fitted to the tractor, together with all the accessories needed for engine operation. If a bonnet is to be removed in order to make the mark visible, this requirement shall be considered to have been met if removal of that bonnet is simple and does not require the use of a tool.

In case of doubt concerning the meeting of this requirement, it shall be considered to have been met if an additional mark containing at least the engine identification number and the name, trade name or logo of the manufacturer has been added.

That additional mark shall be affixed to, or next to, a major component that would not normally have to be replaced during the service life of the engine, and be easily accessible, without the assistance of tools, during routine maintenance operations; otherwise, it must be located at a distance from the original mark on the engine crankcase. The original mark and, where appropriate, the additional mark shall both be clearly visible once all of the accessories needed for the operation of the engine have been fitted. A bonnet meeting the requirements set out in the above paragraph shall be authorised. The additional mark shall be affixed in a durable manner preferably directly to the topside of the engine, for example by means of an engraving, or a sticker or plate that meets the requirements of Item 2.

4. The engines must be classified by means of their identification numbers in such a way that the production sequence can be determined unambiguously.
5. Before leaving the production line, the engines must bear all of the required marks.
6. The exact location of the engine marks shall be declared in the information document, in accordance with Annexes I and II.

Appendix 4

Numbering

1. The EC type-approval number shall consist of five sections, separated by the sign ‘*’:

Section 1	<p>A lower-case letter ‘e’ followed by the distinguishing number of the Member State which has granted the type-approval:</p> <ul style="list-style-type: none"> ‘1’ for Germany ‘2’ for France ‘3’ for Italy ‘4’ for the Netherlands ‘5’ for Sweden ‘6’ for Belgium [^{F2}‘7’ for Hungary ‘8’ for the Czech Republic] ‘9’ for Spain ‘11’ for the United Kingdom ‘12’ for Austria ‘13’ for Luxembourg ‘17’ for Finland ‘18’ for Denmark [^{F2}‘20’ for Poland] ‘21’ for Portugal ‘23’ for Greece ‘24’ for Ireland [^{F2}‘26’ for Slovenia ‘27’ for Slovakia ‘29’ for Estonia ‘32’ for Latvia ‘36’ for Lithuania ‘CY’ for Cyprus ‘MT’ for Malta]
Section 2	The number of the base Directive followed by a letter A for stage I, letter B for stage II
Section 3	The number of the latest amending Directive applicable to the approval. If a Directive contains different implementation dates referring to different technical standards, an alphabetical character shall be added in order to specify the standard in accordance with which the approval was granted
Section 4	A four-digit sequential number (with leading zeros as applicable) to denote the base approval number. The sequence shall start from 0001 for each base Directive
Section 5	A two-digit sequential number (with leading zeros as applicable) to denote the extension.

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The sequence shall start from 00 for each approval number

Textual Amendments

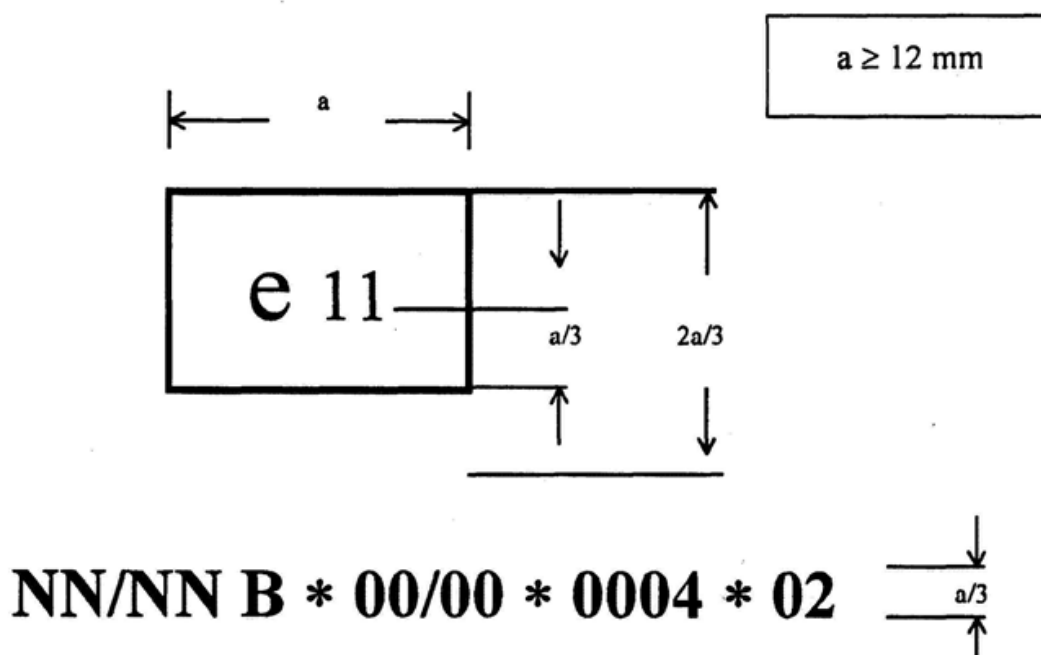
F2 Inserted by Act concerning the conditions of accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic and the adjustments to the Treaties on which the European Union is founded.

2. Example of the third approval by France according to this Directive meeting the requirements of stage I of this Directive:
e2*NN/NN⁽²⁾A*00/00*0003*00
3. Example of the second extension to the fourth approval issued by the United Kingdom according to this Directive meeting the requirements of stage II of this Directive:
e11*NN/NN⁽³⁾B*00/00*0004*02

Appendix 5

EC type-approval mark

1. The EC type-approval mark will consist of a rectangle surrounding the lower case letter 'e' followed by the distinguishing number or letters of Sections 2 to 5 of the EC type-approval number.
2. Example of the EC type-approval mark:



ANNEX II

REQUIREMENTS FOR THE EC TYPE-APPROVAL OF A
TRACTOR TYPE EQUIPPED WITH A COMPRESSION-IGNITION
ENGINE IN RESPECT OF THE POLLUTANTS EMITTED

0. GENERAL

Unless otherwise defined by this Directive, the appropriate definitions, symbols and abbreviations contained in Directive 97/68/EC are applicable.

1. DEFINITIONS

- 'Type of tractor in terms of the pollutants emitted' means tractors which display no essential differences with regard to the characteristics as defined in Appendix 1 to this Annex,
- 'Pollutants emitted' means gaseous pollutants (carbon monoxide, hydrocarbons, and nitrogen oxides) and polluting particulates.

2. APPLICATION FOR EC TYPE-APPROVAL FOR A TRACTOR TYPE

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- 2.1. Application for the EC type-approval of a tractor type in respect of its engine
 - 2.1.1. The application for type-approval of a tractor type in terms of the pollutants emitted shall be made by the tractor manufacturer or his agent.
 - 2.1.2. It shall be accompanied by the information document, completed in triplicate, a specimen for which is provided in Appendix 1 to this Annex.
 - 2.1.3. The tractor engine conforming to the 'engine type' or 'parent engine' characteristics described in Appendix 1 to this Annex shall be submitted to the technical service responsible for conducting the approval tests.
- 2.2. Application for the EC type-approval of a tractor type with an approved engine
 - 2.2.1. The application for type-approval of a tractor type in terms of the pollutants emitted shall be made by the tractor manufacturer or his agent.
 - 2.2.2. It shall be accompanied by the information document, completed in triplicate, a specimen for which is provided in Appendix 1 to this Annex and a copy of the EC type-approval certificate for the engine or engine family, if applicable, for the separate technical unit which is installed in the tractor type.

3. SPECIFICATIONS AND TESTS

3.1. General

The provisions of Directive 97/68/EC, Annex I, Section 4, Annexes III, IV and V are applicable.

3.2. Engine installation on the vehicle

The engine installation on the vehicle shall comply with the following characteristics in respect to the type-approval of the engine:

- 3.2.1. intake depression shall not exceed that specified for the type-approved engine,
- 3.2.2. exhaust back pressure shall not exceed that specified for the type-approved engine.
- 3.3. Those tractor components which may affect the pollutants emitted shall be designed, built and assembled in such a way as to meet the technical requirements of this Directive under the tractor's normal operating conditions and despite any vibrations to which it could be subjected.

4. APPROVAL

Any tractor type fitted with an engine which has been issued with a certificate of approval in accordance with Annex I or the provisions mentioned in Annex III shall be issued with a type-approval certificate in accordance with Appendix 2 to this Annex.

5. ENGINE MARKING

The engine shall be marked in accordance with the requirements of Appendix 3 to Annex I. The EC type-approval identification number must meet the requirements of Appendices 4 and 5 to Annex I.

6. CONFORMITY OF PRODUCTION

Without prejudice to the requirements of Article 8 of Directive 74/150/EEC, conformity of production shall be checked in accordance with the provisions of Section 5 of Annex I to Directive 97/68/EC.

Appendix 1

Information document

Concerning the EC type-approval of a type of tractor equipped with a compression-ignition engine in terms of the pollutants emitted

The information set out below shall be supplied in triplicate and be accompanied by a list of enclosures. Any drawings needed shall be supplied to an appropriate scale and with sufficient details in A4 format or in a folder of this format. Photographs shall, where needed, show sufficient detail

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SECTION 1 GENERAL

1. Tractor type

- 1.1. Make(s) (trade name of manufacturer):
- 1.2. Type and commercial description of the tractor:
- 1.3. Manufacturer's type codes if marked on the tractor and method of affixing:
- 1.3.1. Location, coding and method of affixing of the tractor identification number:
- 1.3.2. Location and method of affixing of the EC type-approval mark:
- 1.4. Name and address of manufacturer:
- 1.5. Address(es) of assembly plant(s):

SECTION 2 TRACTOR TYPE

2. Essential characteristics of the tractor type

- 2.1. Description of the compression-ignition engine
- 2.1.1. Manufacturer:
- 2.1.2. Manufacturer's code as affixed to engine:
- 2.1.3. Cycle: four stroke/two stroke (!)
- 2.1.4. Bore: mm
- 2.1.5. Stroke: mm
- 2.1.6. Number and arrangement of cylinders: cm³

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- 2.1.7. Swept volume: cm³
- 2.1.8. Rated speed: r/min
- 2.1.9. Peak torque speed: r/min
- 2.1.10. Compression ratio⁽²⁾:
- 2.1.11. Combustion system:
- 2.1.12. Drawing(s) of combustion chamber and piston crown:
- 2.1.13. Minimum cross sectional area of inlet and outlet ports:
- 2.1.14. Cooling system
- 2.1.14.1. Coolant
- 2.1.14.1.1. Nature of coolant:
- 2.1.14.1.2. Circulating pump(s): yes/no⁽¹⁾
- 2.1.14.1.3. Characteristics or make(s) and type(s) (if applicable):
- 2.1.14.1.4. Drive ratio(s) (if applicable):
- 2.1.14.2. Air
- 2.1.14.2.1. Blower: yes/no⁽¹⁾
- 2.1.14.2.2. Characteristics or make(s) and type(s) (if applicable):
- 2.1.14.2.3. Drive ratio(s) (if applicable):
- 2.1.15. Temperature permitted by the manufacturer:
- 2.1.15.1. Liquid cooling: maximum temperature at outlet: K
- 2.1.15.2. Air cooling: reference point:
- Maximum temperature at reference point: K
- 2.1.15.3. Maximum charge air temperature at the intercooler outlet (if applicable): K
- 2.1.15.4. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s): K
- 2.1.15.5. Lubricant temperature: minimum: K maximum: K

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- 2.1.16. Pressure charger: yes/no ⁽¹⁾
- 2.1.16.1. Make:
- 2.1.16.2. Type:
- 2.1.16.3. Description of the system (e.g. maximum charge pressure, waste-gate, if applicable):
- 2.1.16.4. Intercooler: yes/no ⁽¹⁾
- ▶ ⁽¹⁾ 2.1.17. Intake system: maximum allowable intake depression at rated engine speed and at 100 % load:
..... kPa
- 2.1.18. Exhaust system: maximum permissible exhaust back pressure at rated engine speed and at 100 %
load: kPa
- 2.2. Additional anti-pollution devices (if any, and if not covered by another heading)
Description and/or diagram(s):
- 2.3. Fuel feed
- 2.3.1. Feed pump
Pressure ⁽²⁾ or characteristic diagram: kPa
- 2.3.2. Injection system
- 2.3.2.1. Pump
- 2.3.2.1.1. Make(s):
- 2.3.2.1.2. Type(s):
- 2.3.2.1.3. Delivery: and mm³ ⁽²⁾ per stroke or cycle at pump speed of: r/min
(rated), and r/min (maximum torque) respectively, or characteristic diagram.
State which method used: on engine/on pump bench ⁽¹⁾
- 2.3.2.1.4. Injection advance
- 2.3.2.1.4.1. Injection advance curve ⁽²⁾
- 2.3.2.1.4.2. Timing ⁽²⁾:

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2.3.2.2. Injection piping

2.3.2.2.1. Length mm

2.3.2.2.2. Internal diameter: mm

2.3.2.3. Injector(s)

2.3.2.3.1. Make(s):

2.3.2.3.2. Type(s):

2.3.2.3.3. Opening pressure (2) or characteristic diagram (1):

2.3.2.4. Governor

2.3.2.4.1. Make(s):

2.3.2.4.2. Type(s):

2.3.2.4.3. Speed at which cut-off starts under full load (2): r/min

2.3.2.4.4. Maximum no-load speed (2): r/min

2.3.2.4.5. Idling speed (2): r/min

2.3.3. Cold-start system

2.3.3.1. Make(s):

2.3.3.2. Type(s):

2.3.3.3. Description:

2.4. Valve timing

2.4.1. Maximum lift and angles of opening and closing in relation to top dead centre or equivalent data: ..
.....

2.4.2. Reference clearances and/or setting ranges (1):

2.5. Electronic command functions

If the engine features electronically controlled functions, the information concerning their performance should be provided including:

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- 2.5.1. **Make:**
- 2.5.2. **Type:**
- 2.5.3. **Part No:**
- 2.5.4. **Location of engine electronic control unit:**
- 2.5.4.1. **What does it sense:**
- 2.5.4.2. **What does it control:**
- ▶⁽¹⁾2.6. **Porting configuration**
- 2.6.1. **Position, size and number:**◀

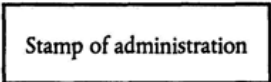
(¹) Delete where appropriate.
(²) Specify the tolerance.

Appendix 2

SPECIMEN

(Maximum format A4 (210 x 297 mm))

EC TYPE-APPROVAL CERTIFICATE



Communication concerning the:

- type-approval (1)
— extension of type-approval (1)
— refusal of type-approval (1)
— withdrawal of type-approval, (1)

of a type of tractor equipped with a compression-ignition engine pursuant to Directive .../.../EC, on pollutant emissions.

EC type-approval No:

Extension No (2):

Reason for extension (2):

SECTION I

0. General

0.1. Make(s) (name of undertaking)

0.2. Name and address of the manufacturer (or if appropriate of his agent) of the type of tractor:

0.3. Manufacturer's type code as marked on the tractor:

Location:

Method of affixing:

0.4. Location, code and method of affixing of the tractor identification number:

0.5. Location and method of affixing of the EC type-approval mark:

0.6. Name(s) and address(es) of assembly plant(s):

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SECTION II

1. Restrictions on use of engine (if any):

1.1. Particular conditions to be met when fitting the engine(s) to the tractor:

1.1.1. Maximum permissible intake depression: kPa

1.1.2. Maximum permissible back pressure: kPa

2. The engine or tractor has been subjected to specific component type-approval YES/NO ⁽¹⁾

2.1. If YES

2.1.1. Reference Directives or Regulations: Directive 97/68/EC, or where appropriate Directive 88/77/EEC / UN-ECE Regulation No 49.02 / UN-ECE Regulation No 96

2.1.2. Component type-approval No
and attach the component type-approval certificate for the engine type or family concerned

2.2. If NO

2.2.1. Technical service responsible for carrying out the component type-approval tests:
.....

2.2.2. Date of test report:

2.2.3. No of test report:

▶⁽¹⁾ 2.2.4. Test results

Measured in accordance with the requirements of Directive 97/68/EC

CO (g/kWh)	HC (g/kWh)	NO _x (g/kWh)	HC+NO _x (g/kWh)	Particulates (g/kWh)

2.3. Tractor components which may affect the pollutants emitted (indicate, if relevant, the nature of effect):

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3. The undersigned hereby certifies the accuracy of the manufacturer's description of the tractor type given above and that the test results mentioned in the type-approval file are correct.

Type-approval is granted/refused/withdrawn⁽¹⁾

Place:

Date:

Signature:

Annex:

Type-approval file:

—

⁽¹⁾ Delete where appropriate.

⁽²⁾ Where appropriate.

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[^{F1}ANNEX III

RECOGNITION OF ALTERNATIVE TYPE-APPROVALS

1. For stage I the following certificates of type-approvals are recognised to be equivalent for engines of categories A, B and C as defined in Directive 97/68/EC:
 - 1.1. certificates of type-approvals according to Directive 97/68/EC;
 - 1.2. certificates of type-approvals according to Directive 88/77/EEC, complying with the requirements of stage A or B regarding Article 2 and Annex I, Section 6.2.1 of Directive 88/77/EEC as amended by Directive 91/542/EEC, or UN-ECE Regulation 49.02 series of amendments corrigenda I/2;
 - 1.3. certificates of type-approvals according to UN-ECE Regulation 96.
2. For stage II the following certificates of type-approvals are recognised to be equivalent:
 - 2.1. certificates of type-approvals according to Directive 97/68/EC, stage II for engines of categories D, E, F and G;
 - 2.2. type-approvals to Directive 88/77/EEC as amended by Directive 99/96/EC which are in compliance with stages A, B1, B2 or C provided for in Article 2 and section 6.2.1 of Annex I;
 - 2.3. UN-ECE Regulation 49.03 series of amendments;
 - 2.4. UN-ECE Regulation 96 stage B approvals according to paragraph 5.2.1 of the 01 series of amendments of Regulation 96.
3. For stage III A the following certificates of type-approvals are recognised to be equivalent:

Certificates of type-approvals according to Directive 97/68/EC, stage III A for engines of categories H, I, J and K.
4. For stage III B the following certificates of type-approvals are recognised to be equivalent:

certificates of type-approvals according to Directive 97/68/EC, stage III B for engines of categories L, M, N and P.
5. For stage IV the following certificates of type-approvals are recognised to be equivalent:

certificates of type-approvals according to Directive 97/68/EC, stage IV for engines of categories Q and R.]

[^{F3} ANNEX IV

PROVISIONS FOR TRACTORS AND ENGINES PLACED ON THE MARKET UNDER THE FLEXIBILITY SCHEME LAID DOWN IN ARTICLE 3A

Textual Amendments

F3 Inserted by Commission Directive 2005/13/EC of 21 February 2005 amending Directive 2000/25/EC of the European Parliament and of the Council concerning the emission of gaseous and particulate pollutants by engines intended to power agricultural or forestry tractors, and amending Annex I to Directive 2003/37/EC of the European Parliament and of the Council concerning the type-approval of agricultural or forestry tractors (Text with EEA relevance).

1. ACTIONS BY THE ENGINE AND THE TRACTOR MANUFACTURERS
 - 1.1. A tractor manufacturer, who wishes to make use of the flexibility scheme, shall request permission from his approval authority to place or to source from his engine suppliers, in the period between two emissions stages, the quantities of engines described in section 1.2 and 1.3 that do not comply with the current emission limit values, but are approved to the nearest previous stage of emission limits.
 - 1.2. The number of engines placed on the market under a flexibility scheme shall, in each engine category, not exceed 20 % of the tractor manufacturer's annual sales of tractors with engines in that engine category (calculated as the average of the latest 5 years sales on the EU market). In the case that a tractor manufacturer has marketed tractors in the EU for a period of less than five years the average will be calculated based on the period for which the tractor manufacturer has marketed tractors in the EU.
 - 1.3. As an alternative option to section 1.2, the tractor manufacturer may seek permission for his engine suppliers to place on the market a fixed number of engines under the flexibility scheme. The number of engines in each engine category shall not exceed the following values:

Engine Category	Number of Engines
19-37 kW	200
37-75 kW	150
75-130 kW	100
130-560 kW	50

- 1.4. The tractor manufacturer shall include in his application to an approval authority the following information:
 - (a) a sample of the labels to be affixed to each tractor in which an engine placed on the market under the flexibility scheme will be installed. The labels shall bear the following text: 'TRACTOR NO ... (sequence of tractors) OF ... (total number of tractors in respective power band) WITH ENGINE NO. ... WITH TYPE APPROVAL (Directive 2000/25/EC) NO ...'; and
 - (b) a sample of the supplementary label to be affixed on the engine bearing the text referred to in section 2.2 of this Annex.

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- 1.5. The tractor manufacturer shall provide the approval authority with any information connected with the implementation of the flexibility scheme that the approval authority may request necessary to make a decision.
- 1.6. The tractor manufacturer shall file a report every six months to the approval authorities of each Member State, where the tractor or engine is put on the market, on the implementation of the flexibility schemes he is using. The report shall include cumulative data on the number of engines and tractors placed on the market under the flexibility scheme, engine and tractor serial numbers, and the Member States where the tractor has been entered into service. This procedure shall be continued as long as a flexibility scheme is still in progress.

2. ACTIONS BY THE ENGINE MANUFACTURER

- 2.1. An engine manufacturer may supply engines to a tractor manufacturer under a flexibility scheme covered by an approval in accordance with section 1 of this annex.
- 2.2. The engine manufacturer must put a label on those engines with the following text: 'Engine placed on the market under the flexibility scheme'.

3. ACTIONS BY THE APPROVAL AUTHORITY

The approval authority shall evaluate the content of the flexibility scheme request and the enclosed documents. As a consequence it will inform the tractor manufacturer of its decision as to whether or not to allow use of the flexibility scheme.]

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- (1) Delete where inappropriate.
- (2) NN/NN = the number of these Directives.
- (3) NN/NN = the number of these Directives.