



RULES

PUBLICATION 93/P

EMISSIONS OF GASEOUS AND PARTICULATE POLLUTANTS FROM DIESEL ENGINES

July
2019

Publications P (Additional Rule Requirements) issued by Polski Rejestr Statków
complete or extend the Rules and are mandatory where applicable.

GDAŃSK

Publication 93/P – Emissions of Gaseous and Particulate Pollutants from Diesel Engines – July 2019 was approved by PRS Executive Board on 28 June 2019 and enters into force on 1 July 2019.

The *Publication* has been prepared in accordance with *Commission Directive 2009/46/EC* (Chapter 8a, Administrative instruction No. 23, Appendix V, Annex to Engine Parameter Protocol) and Annex II (item 52) to *Directive 2006/87/EC*, and completed with *UE Directive 2016/1628*.

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INTRODUCTION

1. This *Publication* has been developed in accordance with *Commission Directive 2009/46/EC* of 24 April 2009 and *Directive (EU) 2016/1628* of 14 September 2016 *EU* for diesel engine systems installed on inland waterways vessels or in machinery onboard such vessels.
2. The purpose of this *Publication* is to determine requirements of effective reduction of emissions of gaseous and particulate pollutants in accordance with *Directive (EU) 2016/1628*.

1 GENERAL

1.1 Application

1.1.1 The requirements specified in this *Publication* apply to all engines with a rated power output of more than 19 kW installed in inland waterways vessels or in machinery on board such vessels.

1.2 Definitions

In this *Publication* the following definitions apply:

1.2.1 *Engine* – engine which works on a compression-ignition principle (diesel engine).

1.2.2 *Propulsion engine* – engine for propulsion of an inland waterways vessel, as defined in Article 3 of *Directive (EU) 2016/1628*.

1.2.3 *Auxiliary engine* – engine for other application than ship propulsion.

1.2.4 *Replacement engine* - an engine that:

- a) is exclusively used to replace an engine already placed on the market and installed onboard; and
- b) complies with an emission stage which is lower than that applicable on the date of the engine's replacement;

1.2.5 *Type approval* – procedure as defined in Article 3, the second indent of *Directive (UE) 2016/1628*, whereby it is certified that an engine family with regard to the level of emission of gaseous and particulate pollutants by the engine(s) fulfils the relevant technical requirements.

1.2.6 *Installation test* – procedure whereby the competent authority makes sure that, even where an engine fitted to a craft has, since the issuing of the type-approval, undergone any modifications or adaptations with regard to the level of emission of gaseous and particulate pollutants, that engine still fulfils the technical requirements of this *Publication*.

1.2.7 *Special test* – procedure whereby the competent authority makes sure that, after each significant modification to a craft's engine with regard to the level of emission of gaseous and particulate pollutants, such an engine still fulfils the technical requirements of this *Publication*.

1.2.8 *Engine family* – manufacturer's grouping of engines **types** which through their design, have similar exhaust emission characteristics **and respect the applicable emission limit values** as defined in Article 18(2) of *Directive (UE) 2016/1628*, and which fulfil the requirements specified in Chapter 3.

1.2.9 *Manufacturer* – **any natural or legal** person, as defined in Article 3 of *Directive (UE) 2016/1628* who is responsible to the approval authority for all aspects of the **engine** type-approval **or authorisation** process and for ensuring conformity of **engine** production. **and who is also**

responsible for market surveillance concerns for the engines produced, whether or not they are directly involved in all stages of the design and construction of the engine which is the subject of type approval process.

1.2.10 *Engine parameter protocol* – document in accordance with the Appendix to this *Publication* (Engine Parameter Protocol), in which all the parameters, together with changes, and including components and engine settings which affect the level of emission of gaseous and particulate pollutants from the engine are duly recorded.

1.2.11 *Engine manufacturer's instructions on monitoring the components and engine parameters of relevance in an exhaust gas context* – document produced for the purpose of implementing the installation test and the intermediate or special tests.

2 GENERAL REQUIREMENTS

2.1 All engines with a rated power output more than 19 kW installed in inland waterways vessels or in machinery on board such vessel shall fulfil the requirements of reduced emissions of gaseous and particulate pollutants in the full range of operation, i.e. speed and torque.

2.2 The engines shall fulfil the requirements of *Directive (UE) 2016/1628*.

2.3 Compliance with the exhaust gas emission limit values of the applicable stage shall be determined on the basis of a type-approval in accordance with Chapter 3.

2.4 Installation tests:

- .1** after the installation of the engine on board, but before it is brought into service, an installation test shall be performed. This test, which forms part of the initial survey of the craft, or of an occasional survey by virtue of the relevant engine having been installed, shall result either in the registration of the engine in the Community certificate to be issued for the first time or in the modification of the existing Community certificate.
- .2** competent authority may dispense with an installation test in accordance with point 2.4.1, if an engine having a rated power output P_N of less than 130 kW is replaced by an engine covered by the same type-approval. As a precondition, the vessel's owner or his authorised representative is required to notify the competent authority of the engine's replacement and to submit a copy of the type-approval document and details of the identification number of the newly installed engine. Competent authority makes appropriate amendments to the Community certificate (see box 52).

2.5 After each significant modification to an engine, where such modifications have the potential to affect the emission of gaseous and particulate pollutants from the engine, a special test shall invariably be performed.

2.6 The results of tests mentioned in paragraphs from 2.4 to 2.6 are registered in the engine parameter protocol.

2.7 Competent authority indicates in the Community certificate, in box 52, the type-approval numbers and identification numbers of all the engines that are installed on board the vessel and that are subject to the requirements of this *Publication*.

3 RECOGNISED TYPE APPROVALS

3.1 The following type-approvals shall be recognised, provided that the engine application is covered by the appropriate type approval:

- .1 type-approvals in accordance with *Directive (UE) 2016/1628*.

3.2 Manufacturers shall ensure that engine types and engine families are designed, constructed and assembled so as to comply with the requirements laid down in Chapter II and III of *Directive (UE) 2016/1628*.

3.3 As from the dates for the placing on the market of the engines set out in Annex III of *Directive (UE) 2016/1628*, engine types and engine families shall not exceed the exhaust emission limit values referred to as Stage V and set out in Annex II of *Directive (UE) 2016/1628*.

Where, in accordance with the parameters defining the engine family laid down in the relevant implementing act, one engine family covers more than one power range, the parent engine (for the purposes of the type-approval) and all engine types within the same family (for the purposes of conformity of production) shall, with respect to the applicable power ranges:

- a) meet the most stringent emission limit values;
- b) be tested using the test cycles that correspond to the most stringent emission limit values;
- c) be subject to the earliest applicable dates for the type-approval and placing on the market set out in Annex III of *Directive (UE) 2016/1628*.

3.4 The exhaust emissions of engine types and engine families shall be measured on the basis of the test cycles set out in Article 24 and in accordance with Article 25 of *Directive (UE) 2016/1628*.

3.5 Engine types and engine families shall be designed and fitted with emission control strategies in such a way as to prevent tampering to the extent possible. The use of defeat strategies shall be prohibited.

3.6 For each type-approved engine, the following documents or their copies shall be kept available on board:

- .1 type-approval certificate;
- .2 engine manufacturer's instructions on monitoring the components and engine parameters of relevance in an exhaust gas context;
- .3 engine parameter protocol.

4 INSTALLATION TEST AND INTERMEDIATE AND SPECIAL TEST

4.1 At the time of the installation test in accordance with paragraph 2.4 and in the event of intermediate tests in accordance with paragraph 2.5 and special tests in accordance with paragraph 2.6, the current state of engine – with reference to the components, adjustments and parameters specified in the instructions in accordance with paragraph 1.2.10 – is subject to inspection.

4.2 In case of incompliance with the approved engine type or the approved engine family PRS may:

- .1 require:
 - steps to be taken to re-establish the engine compliance;
 - appropriate modifications to the type-approval document; or
- .2 order the actual emissions to be measured.

Unless the engine compliance has been re-established or unless the appropriate modifications to the type-approval document have been made or if the measurements indicate non-compliance

with the emission limit values, the competent authority shall refuse to issue the Community certificate or shall revoke any Community certificate that has already been issued.

4.3 In the case of engines with exhaust gas after treatment systems, checks shall be carried out to establish that these systems are functioning properly in the context of the installation test and the intermediate or special tests.

4.4 Tests mentioned in paragraph 4.1 shall be performed in accordance with the engine manufacturer's instruction on monitoring the components and engine parameters of relevance in an exhaust gas emission context. The instruction, drawn up by the manufacturer and approved by a competent authority, shall specify the exhaust relevant components as well as adjustments and parameters, whereby continuous compliance with the exhaust gas emission limit values can be assumed.

The instruction shall contain at least the following details:

- .1** type of engine, where appropriate, engine family with an indication of the rated output and rated speed;
- .2** list of the components and engine parameters of relevance in an exhaust gas emission context;
- .3** unambiguous features to identify the permitted components of relevance in an exhaust gas emission context (e.g. part numbers appearing on the components);
- .4** engine parameters of relevance in an exhaust gas emission context such as setting ranges for the injection timing, permitted cooling water temperature, maximum exhaust gas backpressure, etc.

In the case of engines fitted with exhaust gas after treatment systems, the instruction shall also include procedures to check that the exhaust gas after treatment installation is operating efficiently.

4.5 Installation of engines in craft shall comply with the restrictions specified in the type approval scope. In addition, the intake under pressure and the exhaust gas back pressure shall not exceed the values indicated for the approved engine.

4.6 If the engines being installed on board belong to an engine family, no readjustments or modifications which could adversely affect exhaust gas and particulate emissions or which lie outside the proposed adjustment range may be performed.

4.7 If, after type-approval, readjustments or modifications to the engine need to be made, these shall be accurately entered in the engine parameter protocol.

4.8 If the installation and intermediate tests show that, in relation to their parameters, components and adjustable features, the engines installed on board comply with the specifications provided in the instructions in accordance with paragraph 1.2.10, then it may be assumed that the exhaust gas and particulate emissions from the engines likewise comply with the basic limit values.

4.9 Where an engine has obtained type-approval, the competent authority may, at its own discretion, reduce the installation test or intermediate test. However, the full test shall be performed in respect of at least one cylinder or one engine of an engine family and may only be reduced if there is reason to believe that all other cylinders or engines behave similarly to the cylinder or engine under investigation.

5 APPENDICES

5.1 Engine Parameter Protocol

0. General

0.1 Engine information

0.1.1 Make:

0.1.2 Manufacturer's description:

0.1.3 Type-approval number:

0.1.4 Engine identification number:

0.2 Documentation

The engine parameters should be tested and the test results documented. The documentation should consist of separate sheets, individually numbered, signed by the controller and attached to this protocol.

0.3 Test

The test should be carried out on the basis of the Engine manufacturer's instructions on monitoring the components and engine parameters of relevance in an exhaust gas context. In duly motivated cases controllers may, at their own discretion, dispense with checks on certain engine parameters.

0.4 This engine parameter protocol, including the accompanying chart readings, comes to a total of ... (*) pages.

1. Engine parameters

This is to certify that the engine under test does not deviate excessively from the prescribed parameters.

1.1 Installation inspection

Name and address of the test facility:

.....

.....

Name of the controller:

Place and date:

Signature:

Test recognised by competent authority:

.....

.....

Place and date:

Signature:



(*) To be filled in by the controller.

1.2 Intermediate test Special test

Name and address of the test facility:
.....
.....
Name of the controller:
Place and date:
Signature:
Test recognised by competent authority:
.....
.....

Place and date:
Signature:



1.2 Intermediate test Special test

Name and address of the test facility:
.....
.....
Name of the controller:
Place and date:
Signature:
Test recognised by competent authority:
.....
.....

Place and date:
Signature:



1.2 Intermediate test Special test

Name and address of the test facility:
.....
.....
Name of the controller:
Place and date:
Signature:
Test recognised by competent authority:
.....
.....

Place and date:
Signature:



5.2 Annex to Engine Parameter Protocol

Craft name: European Vessel Identification Number:

Installation inspection Intermediate test Special test

Manufacturer: Engine type:
(Trade name/trade mark/trade name of the manufacturer) (Engine family/manufacturer's description)

Rated power (kW) Rated speed [1/min]: Number of cylinders

Use for which the engine is intended
(Craft main propulsion/generator propulsion/forward beam propulsion/auxiliary engine, etc.)

Type approval number Year of engine construction

Engine identification number Place of installation
(Serial number/unique identification number)

The engine and engine components of relevance in an exhaust gas context have been identified on the basis of the data plate details.

The test has been carried out on the basis of the engine manufacturer's instructions on monitoring the components and engine parameters of relevance in an exhaust gas context.

A. COMPONENT TEST

Additional components of relevance in an exhaust gas context and listed in the *Engine manufacturer's instructions on monitoring the components and engine parameters of relevance in an exhaust gas context* should be included in the table.

Component	Component number recorded	Conformity		
Camshaft/piston		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Injection valve		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Data set/software number		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Injection pump		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
cylinder head		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Exhaust-gas turbocharger		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Charge air cooler		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

B. VISUAL INSPECTION OF THE ADJUSTABLE FEATURES AND ENGINE PARAMETERS

Parameter	Value recorded	Conformity	
Injection timing, injection period		<input type="checkbox"/> Yes	<input type="checkbox"/> No

C. INSPECTION OF THE AIR INTAKE AND THE EXHAUST SYSTEM

<input type="checkbox"/>	Measurements have been taken in order to verify compliance with the authorised values
<input type="checkbox"/>	Intake under pressure: kPa at rated speed and full load
	Exhaust gas back pressure: Pa at rated speed and full load
<input type="checkbox"/>	A visual inspection of the air intake and exhaust gas system has been carried out.
	No abnormalities were detected that would suggest non-compliance with the authorised values.

D. COMMENTS:

(The following divergent settings, modifications or changes to the installed engine were noted.)

.....

.....

Surveyor's name:

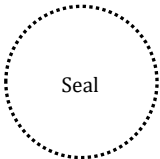
Name of the controller:

Place and date:

Signature:

5.3 Item 52 of Community Certificate

Certificate No. issued by..... (competent authority)

<p>52. Appendix to Certificate No.</p>
<p>(*). Amendment(s) to item: New record:</p> <p>(*). This page has been replaced. , (Place) (Date)  Competent authority Signature</p> <p>(*) Delete as appropriate</p>
<p>Continued on page (*) End of Community certificate (*)</p>



List of amendments effective as of 1 July 2019

<i>Item</i>	<i>Title/Subject</i>	<i>Source</i>
1.2.2	Definition of propulsion engine	Directive (UE) 2016/1628
1.2.4	Definition of replacement engine	
1.2.5	Definition of type approval	
1.2.8	Definition of engine family	
1.2.9	Definition of manufacturer	
3.1.3	Recognised type approvals	
3.2-3.5	Recognised type approvals	