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### Economic Commission for Europe

#### Inland Transport Committee

#### Working Party on Inland Water Transport

#### Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation

#### Fifty-first session

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Item 3 (c) of the provisional agenda

#### Standardization of technical and safety requirements in inland navigation: Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels (Resolution No. 61, revised)

### **Aligning of provisions for engines in Resolution No. 61, revised (Chapters 8, 8A and a proposal for a new Annex) with the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)**

#### Note by the secretariat

#### Mandate

1. This document is submitted in line with cluster 5: Inland Waterway Transport, para. 5.1 of the programme of work 2016-2017 (ECE/TRANS/2016/28/Add.1) adopted by the Inland Transport Committee at its seventy-eighth session on 26 February 2016.
2. It is recalled that, following the decision of the Working Party on Inland Water Transport (SC.3) at its sixtieth session to align the Annex with the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)<sup>1</sup> (ECE/TRANS/SC.3/203, para. 67) adopted by the European committee for drawing up common standards in the field of inland navigation (CESNI). SC3/WP3 asked the secretariat to continue revising the Annex to Resolution No. 61 on the basis of the analysis set out in ECE/TRANS/SC.3/WP.3/2017/7 (ECE/TRANS/SC.3/WP.3/100).

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<sup>1</sup> [www.cesni.eu/documents/es-trin/](http://www.cesni.eu/documents/es-trin/)

3. SC.3/WP.3 may wish to use the text of the ES-TRIN provisions reproduced in the Annex to this document as the basis for updating Chapters 8 and 8A of the Annex to Resolution No. 61 and developing a new Appendix to introduce a model of the engine parameter protocol.

## Annex

### **Proposal for updating Chapters 8, 8A of the Annex to Resolution No. 61, revised, and elaborating a new Appendix, Engine parameter protocol**

#### **I. Proposal for updating Chapter 8, Engine design**

The present Section reproduces the text of Articles 8.06 and 8.07 of ES-TRIN.

##### **“Article 8.06**

##### **Storage of lubricating oil, pipes and accessories**

1. Lubricating oil shall be stored in steel tanks which are either an integral part of the hull or which are firmly attached to the hull. If so required by the design of the vessel, an equivalent material in terms of fire-resistance may be used. These requirements shall not apply to tanks having a capacity of no more than 25 litres. Lubricating oil tanks shall not have common partitions with drinking-water tanks.
2. Lubricating oil tanks and their pipework and other accessories shall be laid out and arranged in such a way that neither lubricating oil nor lubricating oil vapour may accidentally reach the inside of the vessel.
3. No lubricating oil tanks may be located forward of the collision bulkhead.
4. Lubricating oil tanks and their fittings shall not be located directly above engines or exhaust pipes.
5. The filler orifices for lubricating oil tanks shall be marked distinctly.
6. Lubricating oil pipes, their connections, seals and fittings shall be made of materials that are able to withstand the mechanical, chemical and thermal stresses to which they are likely to be subjected. The pipes shall not be subjected to any adverse influence of heat and it shall be possible to inspect them throughout their length.
7. Lubricating oil tanks shall be provided with a suitable capacity-gauging device. Capacity-gauging devices shall be legible right up to the maximum filling level. Glass gauges shall be effectively protected against impacts, shall be fitted with an automatic closing device at their base and their upper end shall be connected to the tanks above their maximum filling level. The material used for glass gauges shall not deform under normal ambient temperatures. Sounding pipes shall not terminate in accommodation spaces. Sounding pipes terminating in an engine or boiler room shall be fitted with suitable self-closing devices.

##### **Article 8.07**

##### **Storage of oils used in power transmission systems, control and activating systems and heating systems, pipes and accessories**

1. Oils used in power transmission systems, control and activating systems and heating systems shall be stored in steel tanks which are either an integral part of the hull or which are firmly attached to the hull. If so required by the design of the vessel, an equivalent material in terms of fire-resistance may be used. These requirements shall not apply to tanks having a capacity of no more than 25 litres. Oil tanks according to sentence (1) shall not have common partitions with drinking-water tanks.

2. Oil tanks according to (1) and their pipework and other accessories shall be laid out and arranged in such a way that neither such oil nor such oil vapour may accidentally reach the inside of the vessel.
3. No oil tanks according to (1) may be located forward of the collision bulkhead.
4. Oil tanks according to (1) and their fittings shall not be located directly above engines or exhaust pipes.
5. The filler orifices for oil tanks according to (1) shall be marked distinctly.
6. Oil pipes according to (1), their connections, seals and fittings shall be made of materials that are able to withstand the mechanical, chemical and thermal stresses to which they are likely to be subjected. The pipes shall not be subjected to any adverse influence of heat and it shall be possible to inspect them throughout their length.
7. Oil tanks according to (1) shall be provided with a suitable capacity-gauging device. Capacity-gauging devices shall be legible right up to the maximum filling level. Glass gauges shall be effectively protected against impacts, shall be fitted with an automatic closing device at their base and their upper end shall be connected to the tanks above their maximum filling level. The material used for glass gauges shall not deform under normal ambient temperatures. Sounding pipes shall not terminate in accommodation spaces. Sounding pipes terminating in an engine or boiler room shall be fitted with suitable self-closing devices.”

## **II. Proposal for updating Chapter 8A, Exhaust and pollutant particulate emissions from diesel engines**

The present Section reproduces the text of Chapter 9 of ES-TRIN.

### **“CHAPTER 9 EMISSION OF GASEOUS AND PARTICULATE POLLUTANTS FROM DIESEL ENGINES**

#### **Article 9.00 Definitions**

In this Chapter:<sup>2</sup>

- 8.1 ‘engine’: an engine which works on the compression-ignition principle (diesel engine);
- 8.2 ‘propulsion engine’: an engine for the propulsion of a craft;
- 8.3 ‘auxiliary engine’: an engine for use in applications other than the propulsion of a craft;
- 8.4 ‘exchange engine’: a used, overhauled engine which is intended to replace a currently operational engine and which is of the same design (in-line engine, V-engine) as the engine to be replaced, which has the same number of cylinders and whose power output and speed do not differ by more than 10 per cent from the power output and speed of the engine to be replaced;

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<sup>2</sup> Note of the secretariat: for definitions in Articles 8.1, 8.2, 8.3, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10 and 8.11 see the definitions in paras. 8A-1.1.1, 56 and 57 (Section 1-2), 8A-1.1.3, 8A-1.1.4, 8A-1.1.5, 8A-1.1.6, 8A-1.1.7, 8A-1.1.8 and 8A-1.1.10 r of the Annex to Resolution No 61, respectively.

8.5 'type-approval': the procedure whereby the competent authority certifies that an engine type or an engine family satisfies the relevant technical requirements with regard to the levels of gaseous and particulate pollutants emitted by the engine(s);

8.6 'installation test': the procedure whereby the competent authority makes sure that, even where an engine fitted to a craft has undergone, since the issuing of the type-approval, any modifications or adaptations with regard to the level of emission of gaseous and particulate pollutants, that engine still complies with the technical requirements;

8.7 'intermediate test': the procedure whereby the competent authority makes sure that, even where a craft's engine has undergone, since the installation test, any modifications or any adaptations with regard to the level of emission of gaseous and particulate pollutants, that engine still complies with the technical requirements;

8.8 'special test': the 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, that engine still complies with the technical requirements;

8.9 'engine type': a grouping of identical engines as regards those engines' essential characteristics;

8.10 'engine family': a manufacturer's grouping of engines which through their design, are expected to have similar exhaust emission characteristics of gaseous and particulate pollutants;

8.11 'rated power output': the engine's net power at rated speed and under full load;

8.12 'manufacturer': as defined in Article 2 of Directive 97/68/EC,<sup>3</sup> as amended, means the person or body who is responsible to the approval authority for all aspects of the type-approval process and for ensuring conformity of production. It is not essential that the person or body is directly involved in all stages of the construction of the engine;

8.13 'engine parameter protocol': the document pursuant to Annex 6, 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;

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

#### **Article 9.01 General provisions**

1. Without prejudice to the requirements of Directive 97/68/EC or of the Rhine Vessel Inspection Regulations, the provisions of this Chapter shall apply to all engines with a rated power output more than 19 kW installed in inland waterway vessels or in machinery on board such vessels.

2. The engines shall comply with the requirements of Directive 97/68/EC or the Rhine Vessel Inspection Regulations. This compliance is established by means of a type approval certificate.

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<sup>3</sup> Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 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 (OJ L 59, 27.2.1998).

3. (left void)
4. A copy of the type approval certificate, the engine manufacturer's instructions and the engine parameter protocol shall be kept on board.
5. Installation tests:
  - (a) After the installation of the engine on board, but before it is brought into service, an installation test shall be carried out. This test, which forms part of the initial inspection of the craft, or of a special inspection by virtue of the relevant engine having been installed, shall result either in the registration of the engine in the inland navigation vessel certificate to be issued for the first time or in the modification of the existing inland navigation vessel certificate;
  - (b) The inspection body may dispense with an installation test pursuant to (a), 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 pre-condition, the inspection body shall be notified of the engine's replacement and shall be provided with a copy of the type-approval document and details of the identification number of the newly installed engine. The inspection body shall make the appropriate amendments to item 52 of the inland navigation vessel certificate.
6. Intermediate tests on the engine shall be carried out in the context of the periodical inspection.
7. 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 must invariably be carried out.
8. The results of the tests pursuant to Article 9.00(8.6) to (8.8) shall be registered in the engine parameter protocol.
9. The inspection body shall enter in item 52 of the inland navigation vessel certificate 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 Chapter.
10. For the purpose of discharging tasks pursuant to this Chapter, the competent authority may employ a technical service.

### **Article 9.03**

#### **Installation test and intermediate test and special test**

1. At the time of the installation test pursuant to Article 9.00(8.6) and in the event of intermediate tests pursuant to Article 9.00(8.7) and special tests pursuant to Article 9.00(8.8), the competent authority will inspect the current state of the engine with reference to the components, adjustments and parameters specified in the instructions.

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 set out in the instructions pursuant to Article 9.00(8.14),<sup>4</sup> then it may be assumed that the exhaust gas and particulate emissions from the engines likewise comply with the basic limit values.

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<sup>4</sup> Note of the secretariat: definitions of the installation test, intermediate test and special test; they are similar to the definitions of the installation check, interim check and special check (paras 8A-1.1.4 to 8A-116 of the Annex to Resolution No. 61.

If the authority finds that the engine does not comply with the approved engine type or the approved engine family, it may:

- (a) require that:
  - (aa) steps are taken to re-establish engine conformity,
  - (bb) require appropriate modifications to the type-approval document, or
- (b) order the actual emissions to be measured.

Failing the re-establishment of engine conformity or in the absence of appropriate modifications to the type-approval document or in the event that the measurements indicate non-compliance with the emission limit values, the competent authority shall refuse to issue an inland navigation vessel certificate or shall revoke any inland navigation vessel certificate that has already been issued.

2. 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.

3. The tests according to (1) are made on the basis of the engine manufacturer's instruction on monitoring the components and engine parameters of relevance in an exhaust gas emission context. The instruction, to be drawn up by the manufacturer and to be 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 contains at least the following details:

- (a) type of engine and, where appropriate, engine family with an indication of the rated output and rated speed;
- (b) list of the components and engine parameters of relevance in an exhaust gas emission context;
- (c) unambiguous features to identify the permitted components of relevance in an exhaust gas emission context (e.g. part numbers appearing on the components);
- (d) 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.

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

5. 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 carried out.

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

7. Where an engine has obtained type-approval, the competent authority may, at its own discretion, reduce the installation test or intermediate test pursuant to these provisions. However, the full test shall be carried out 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.

**Article 9.04**

**Technical services**

1. The technical services shall comply with the European Standard on general requirements for the competence of testing and calibration laboratories (EN ISO/IEC 17025 : 2005), having due regard to the following conditions:

- (a) engine manufacturers cannot be recognized as technical services;
- (b) for the purposes of this Chapter, a technical service may, with permission of the competent authority, use facilities outside its own test laboratory;
- (c) if requested to do so by the competent authority, technical services shall demonstrate that they are recognized in a Member State to perform the type of activities referred to in this paragraph.”

**III. Proposal for a new Appendix, Engine parameter protocol**

The present Section reproduces the text of Annex 6 to ES-TRIN.



**“ANNEX 6  
ENGINE PARAMETER PROTOCOL**

(Model)

**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 technical service: .....

.....

Name of the controller: .....

Place and date: .....

Signature: .....

Test recognised by competent authority: .....

.....

.....

Place and date: .....

Signature: .....

Seal of the competent  
authority

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\* To be filled in by the controller.

1.2  Intermediate test  Special test<sup>5</sup>  
Name and address of the technical service: .....  
.....  
.....  
Name of the controller: .....  
Place and date: .....  
Signature: .....  
  
Test recognised by competent authority: .....  
.....  
.....  
  
Place and date: ..... Seal of the competent  
Signature: ..... authority

1.2  Intermediate test  Special test  
Name and address of the technical service: .....  
.....  
.....  
Name of the controller: .....  
Place and date: .....  
Signature: .....  
  
Test recognised by competent authority: .....  
.....  
.....  
  
Place and date: ..... Seal of the competent  
Signature: ..... authority

1.2  Intermediate test  Special test  
Name and address of the the technical service: .....  
.....  
.....  
Name of the controller: .....  
Place and date: .....  
Signature: .....  
  
Test recognised by competent authority: .....  
.....  
.....  
  
Place and date: ..... Seal of the competent  
Signature: ..... authority

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<sup>5</sup> Place a cross in the appropriate box.

**Appendix 1**  
**Annex to the engine parameter protocol**  
**(Model)**

Craft name: ..... Unique European vessel identification number: .....

Installation inspection <sup>1)</sup>                       Intermediate test <sup>1)</sup>                       Special test <sup>1)</sup>

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

Rated power (kW): ..... Rated speed (rpm): ..... 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 <sup>1)</sup>		
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 <sup>1)</sup>	
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 Intake under pressure: ..... kPa at rated speed and full load Exhaust gas back pressure: ..... kPa 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:**

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

Place and date: .....

Signature:

<sup>1)</sup> Place a cross in the appropriate box.

\_\_\_\_\_