

INLAND WATERWAYS TRANSPORT SECTOR

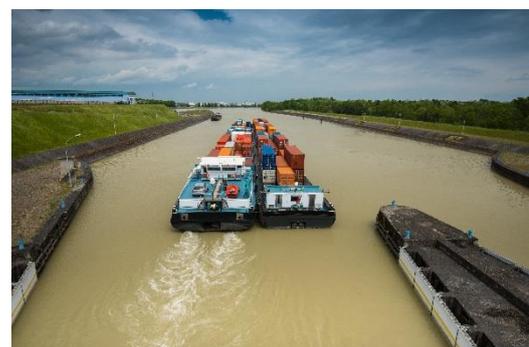
FAQ

FREQUENTLY ASKED
QUESTIONS

Regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery

European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)

July 2023



The European Association of Internal
Combustion Engine Manufacturers



European Committee for drawing up
Standards in the field of Inland
Navigation

INTRODUCTION

EUROMOT is working with partners in the inland waterways transport sector, in particular CESNI, to develop a FAQ document to help those involved with the inland waterways transport sector understand and interpret the applicable requirements to engines in the light of

- the new non-road mobile emissions stage V requirements in Regulation (EU) 2016/1628 and its supplementing regulations (NRMM),
- the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN).

The initial focus has been on the more challenging questions that are specific to inland waterways transport, in particular those where the text requires significant interpretation to make it applicable to the inland waterways transport sector. The answers to more general questions on the Regulation NRMM are included in another FAQ document published on EUROMOT website.

In light of timetable for stage V engines, EUROMOT and CESNI are making these preliminary FAQs and answers available for viewing. Further work is foreseen between EUROMOT and CESNI and could lead to updates of this FAQ document for inland waterways transport sector.

The questions included in this FAQ document can be found in the table of contents.

DISCLAIMER

This FAQ document (hereinafter 'FAQ') reflects the interpretation of EUROMOT and the European Committee for drawing up Standards in the field of Inland Navigation (CESNI) as regards the legal provisions of Regulation and its supplementary legislation and of ES-TRIN, and it must not be considered or intended as a legally binding text for any reason whatsoever.

This FAQ shall be intended as a living document; its content could be modified or updated by EUROMOT aisbl and CESNI, based on updates of the legislation, and according to EUROMOT aisbl and CESNI's understanding on the matter as experience is gained.

EUROMOT aisbl, CESNI, and thereby the Central Commission for the Navigation of the Rhine (CCNR), accept no responsibility for the recommendations, advice, statements and conclusions expressed or implied in this FAQ and give no warranty, representation or assurance with respect to the accuracy or validity of the same. Only the text of the Regulation and of the relevant supplementing legislation as well as of ES-TRIN is authentic in law.

Accordingly, in case of discrepancies between the content and interpretation of this FAQ and the text of the legislation (Regulation and the relevant supplementing legislation as well as ES-TRIN), the legislation shall be applied.

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1 SCOPE OF INLAND WATERWAYS ENGINES – DEFINITION OF “INSTALLED”

How “installed engines” should be understood, in particular for mobile generators and floating equipment?

In February 2018, the Working Group CESNI/PT approved the following definition:

“Installed” means a marine diesel engine that is or is intended to be fitted on a ship, including a portable auxiliary marine diesel engine, only if its fuelling, cooling, or exhaust system is an integral part of the ship. A fuelling system is considered integral to the ship only if it is permanently affixed to the ship. This definition includes a marine diesel engine that is used to supplement or augment the installed power capacity of the ship and is intended to be an integral part of the ship.



In context of the above definition “installed power capacity” is in regard to either auxiliary or propulsion power.

Engines that are not ‘installed’ in the vessel, but are installed in mobile equipment or a mobile machine, in the context of this definition, for example, but not limited to, portable generating sets, portable hydraulic power supply, portable welders/cutters, tracked or wheeled excavators or cranes, would need to comply with non-road mobile machinery engine emission regulation applicable to the machine type, rather than that for an inland waterway vessel engine.

A common application for floating equipment could be a portable power supply brought on board temporarily to power equipment on board including but not limited to jack-up legs.

References:

- ES-TRIN, Article 9.01(2)
- Regulation (EU) 2016/1628, Article 2

2 TYPE-APPROVAL DATE OF ENGINE

What is the type-approval date of an engine category?

The Stage V type-approval date for an engine category is the date from which the approval authority shall not grant a CCNR type-approval or an EU type-approval other than Stage V. For stage V it is one year before the placing on the market date and does not affect placing on the market.

→ For stage V IWP, IWA, and equivalent engines, it means 1.1.2018 for $P < 300$ kW and 1.1.2019 for $P \geq 300$ kW.

It should be noted that **the type-approval deadlines set out in Regulation (EU) 2016/1628 do not prohibit the revision or extension of an existing CCNR or EU type-approval** that has already been granted (for example to change a part number).

Reference: Regulation (EU) 2016/1628, Articles 22(3) and 58(3), Annex III, Tables III-5 and III-6

3 PLACING ON MARKET DATE OF AN ENGINE

What is the placing on the market date of an engine category?

The Stage V placing on market date for an engine category is the date from which the manufacturer or importer must not make available for distribution or use in the EU for the first time either:

- an engine that does not have a stage V (or recognised equivalent) type-approval whether for use in a new or existing vessel; or,
- an inland waterway vessel containing any such engine.

→ For IWP, IWA or equivalent engines, it means 1.1.2019 for $P < 300$ kW and 1.1.2020 for $P \geq 300$ kW.

However, there are exceptions (see items 4, 5, 6)

Reference: Regulation (EU) 2016/1628, Article 3(48) "definitions", Article 5(3), Annex III, Tables III-5 and III-6

4 REPLACEMENT ENGINES

'Replacement engine' means an engine that is exclusively used to replace an engine already placed on the market and installed in non-road mobile machinery and complies with an emission stage which is lower than that applicable on the date of the engine's replacement.

Does the possibility of replacement engines mentioned in Regulation (EU) 2016/1628, Article 58(11) also then apply for engines used in inland navigation that belongs to engine category NRE?



No. ES-TRIN fundamentally prohibits the installation of replacement engines. Indeed, this ban is consistent with the interpretation of the NRMM Regulation handed down by the European Commission.

References:

- *ES-TRIN, Article 9.01(4)*
- *Regulation (EU) 2016/1628, Article 3(11), Article 58(11)*

5 TRANSITION ENGINES – DEFINITION OF PRODUCTION DATE FOR THE VESSEL

What is the production date for the vessel?

The construction date as recorded in item 7 of the inland navigation vessel certificate should be used as the production date of the vessel in respect to Regulation (EU) 2016/1628 Article 3(33). In order to comply with the requirement of the Stage V transition scheme the month shall be noted in addition to the year. This date shall be indicated as part of the marking of the vessel in accordance with Regulation (EU) 2016/1628 Article 15(5).

Where a vessel is not issued with an inland navigation vessel certificate an equivalent date should be determined in accordance with national requirements.

Reference: Regulation (EU) 2016/1628, Article 3(33), Article 15(5), Article 58

6 TRANSITION ENGINES - SCHEME

Under what conditions may transition engines be installed on board inland navigation vessels?

Note: This answer has been updated to take account of Regulation (EU) 2020/1040 and Regulation (EU) 2021/1068 that adapted the transition period to take account of the effects of COVID-19.

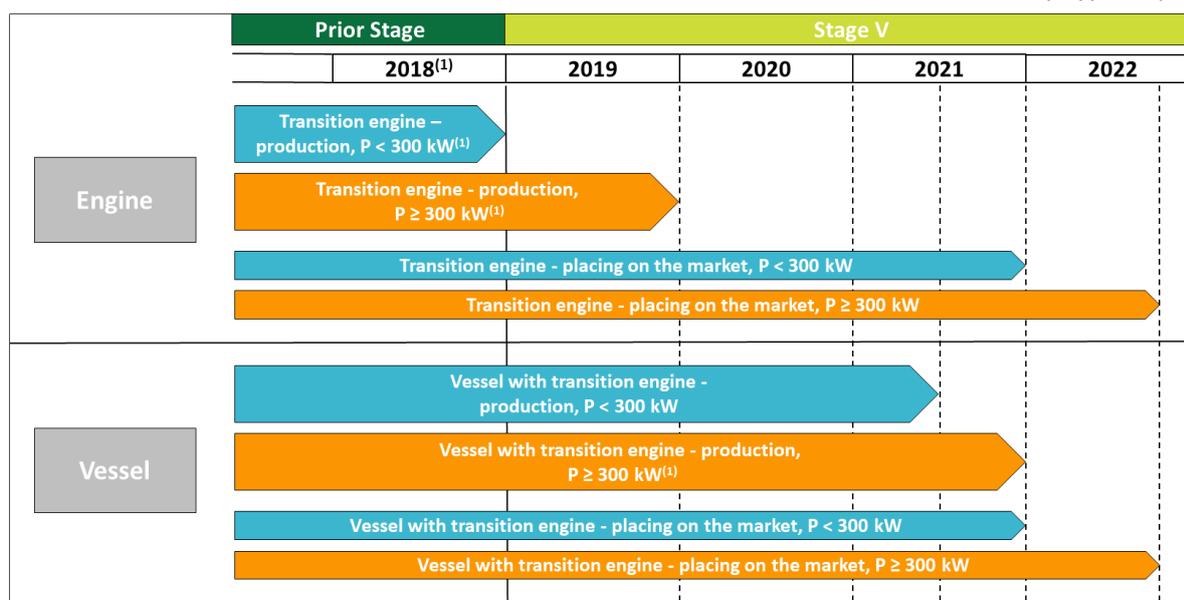
Instead of Stage V IWP, IWA and equivalent engines, a transition engine can be installed on board an inland navigation vessel if:

- the production date of the vessel – (see answer 5) is not later than the 30th June 2021 for P < 300 kW and not later than 31st December 2021 for P ≥ 300 kW; and
- the engine complies with the latest applicable emission limits defined in the relevant legislation applicable on 5 October 2016 (meaning RVIR CCNR II or Directive 97/68/EC); and
- the engine is placed on the market not later than 31st December 2021 for P < 300 kW and not later than 30th September 2022 for P ≥ 300 kW; and
- the inland navigation vessel is placed on the market (see question 11) not later than 31st December 2021 for P < 300 kW and not later than 30th September 2022 for P ≥ 300 kW; and
- the engine was produced before the beginning of the transition period (meaning 1st January 2019 for P < 300 kW and 1st January 2020 for P ≥ 300 kW).

The transition periods applicable to NRE engines, to be used in place of IWA and IWP, are those applicable to IWA and IWP (same dates as above).

Engines of categories IWP & IWA

⁽¹⁾ inclusive of after-treatment (if applicable)



Note: the latest applicable emission limits defined in Directive 97/68/EC on 5 October 2016 are:

1. In case of propulsion engines of all powers and auxiliary engines of more than 560 kW:

- V ($37 \text{ kW} \leq P$) - EU-stage IIIA

2. In case of auxiliary engines no greater than 560 kW:

a) for engines with variable speed the categories

- K ($19 \text{ kW} \leq P < 37 \text{ kW}$) - EU stage IIIA
- P ($37 \text{ kW} \leq P < 56 \text{ kW}$) - EU stage IIIB
- R ($56 \text{ kW} \leq P < 130 \text{ kW}$) - EU stage IV
- Q ($130 \text{ kW} \leq P \leq 560 \text{ kW}$) - EU stage IV

b) for engines with constant speed the categories

- K ($19 \text{ kW} \leq P < 37 \text{ kW}$) - EU stage IIIA
- J ($37 \text{ kW} \leq P < 56 \text{ kW}$) - EU stage IIIA
- I ($56 \text{ kW} \leq P < 130 \text{ kW}$) - EU stage IIIA
- H ($130 \text{ kW} \leq P \leq 560 \text{ kW}$) - EU stage IIIA

Reference: Regulation (EU) 2016/1628, Article 3(33), Article 3(32), Article 58(3)(5)(6) and (7) as amended by Regulation (EU) 2040/1040 and Regulation (EU) 2021/1068

7 TEMPORARY PLACING ON THE MARKET OF ENGINES THAT HAVE NOT BEEN EU TYPE-APPROVED FOR THE PURPOSES OF FIELD TESTING

Is this exemption for inland vessel engines described in Regulation (EU) 2016/1628 Article 34(4) and (9) in conjunction with Delegated Regulation (EU) 2017/654 Article 14 and Annex XI possible, and compatible with ES-TRIN?

Yes. The NRMM Regulation refers to the process of “placing on the market”, which must comply with the requirements of Delegated Regulation (EU) 2017/654 Article 14 and Annex XI. Field testing shall be conducted in accordance with a “recommendation” by the

- CCNR (Rhine Vessel Inspection Regulations (RVIR) Articles 2.19(3) / 2.20(3) from 7 October 2018); or
- EU (Directive (EU) 2016/1629 Article 25(1)(b)).

This recommendation defines the requirements for vessel, including the circumstances in which the engine may be installed pursuant to Directive (EU) 2016/1629 or RVIR.

This exemption is already applicable, even for engines installed before the placing on market dates for IWP/IWA (1.1.2019/2020 depending upon engine power).

References:

- Regulation (EU) 2016/1628, Article 34(4) and (9)(b)
- Delegated regulation (EU) 2017/654, Article 14 and Annex XI
- Implementing regulation (EU) 2017/656, Appendix 2, Table 1 to Article 34(4)
- ES-TRIN, Chapter 9



8 ENGINE/VESSEL TYPES NEWLY IN SCOPE

What engines/vessels are newly in scope?

- The minimum power below which the regulations for inland waterway vessels do not apply has been reduced from 37 kW down to 19 kW for propulsion engines. Engines with reference power below 19 kW installed on vessels are excluded by Regulation (EU) 2016/1628 Article 2(2)(g).
- Inland waterways auxiliary engines with reference power from 19 kW upwards are regulated under the inland waterways part of the regulation whereas previously this was only the case for > 560 kW. Other auxiliary engines fell under the land based requirements in the preceding Directive (97/68/EC as amended). Engine below 19 kW installed on vessels are excluded by Regulation (EU) 2016/1628 Article 2(2)(g), therefore there is no regulation for auxiliary engines with reference power below 19 kW.
- Service craft belonging to supervisory authorities, fire-service vessels and fishing vessels on the fishing vessels register of the Community had exclusions in the preceding directive. However, similar exemptions do not appear in the new Regulation, so they would now be included.
- Engines placed on the market for all passenger vessels that carry 12 or more passengers, with the exception of ferries, are included regardless of the size of the vessel.
- The scope of the regulation has been expanded from only regulating diesel engines to include gaseous-fuelled or any other alternative fuelled engine regardless of whether it uses spark ignition or compression ignition.

Note: the above only applies where the vessels do not have a valid maritime navigation or safety certificate as defined in Regulation (EU) 2016/1628 Article 2(2)(e)

References:

- *Directive 97/68/EC as amended (repealed) Article 2 Definition of inland waterways vessel, Article 7a*
- *Regulation (EU) 2016/1628, Article 3 (34), Article 2(e), (f), (g), (h), Article 4.1(5) and (6)*
- *Directive (EU) 2016/1629, Article 2*

9 VESSELS SUBJECT TO DEROGATION FROM DIRECTIVE (EU) 2016/1629

Do the engine emission requirements apply to vessels that are exempted from the requirements of Directive (EU) 2016/1629 such as those craft operating on non-linked inland waterways (Article 24) or operating under national regulations in zone 4 waters?

Yes they do. Definition (34) of Article 3 of Regulation (EU) 2016/1628 only refers to the scope of Directive (EU) 2016/1629 and does not take account of any derogations.

References:

- Regulation (EU) 2016/1628, Article 2 (2)(f) and Article 3(34)
- Directive (EU) 2016/1629, Article 2



10 DEFINITION OF OEM

The OEM has responsibilities as set out in the definitions in Article 3(54) as well as in Article 15 and 17 of the emission Regulation (EU) 2016/1628. The principle responsibility is for the correct installation of the engine in compliance with the engine manufacturer's instructions, and associated record-keeping and declarations where applicable.

Who is the OEM?

The OEM must be a party taking responsibility for the engine installation, though not necessarily installing the engine itself.

In the case of a new vessel the natural or legal person that receives an order to supply a vessel and has responsibility for the correct production of the vessel including the engine installation, whether or not they are directly involved in all stages of the design and construction of the vessel, would become the OEM.

In the case of installing an engine in an existing vessel the natural or legal person receiving the order to perform the installation take on the responsibilities equivalent to the OEM.

Reference: Regulation (EU) 2016/1628, Article 3(54), Articles 15 and 17

11 PLACING ON MARKET DATE OF VESSEL

To use the transition scheme, it is necessary to determine the 'placing on the market date' of a vessel.

What is the 'placing on the market date' for the vessel?

The definition of placing on the market is based on a single date of transfer, or offer of transfer, of a completed product (in this case the vessel) from the OEM (or importer) to the next economic operator. The requirements applying to placing on the market apply to vessels made available for the first time on the EU market irrespective of whether they are new or used (second-hand).



The date that the inland navigation vessel certificate is first issued, inclusive of a provisional inland navigation vessel certificate, should be used as the date of placing on the market of that vessel.

Where a vessel is not issued with an inland navigation vessel certificate an equivalent date should be determined in accordance with national requirements.

References:

- *The 'Blue Guide' on the implementation of EU product rules 2016*
- *Regulation (EU) 2016/1628, Article 3(47) and (48)*

12 PRODUCTION AND PLACING ON THE MARKET DATE OF A PRE-ASSEMBLED MODULE

What is the production date and placing on the market date of a pre-assembled module, such as a generator set, that is to be installed in an inland waterways vessel?

Where a pre-assembled module, such as a generator set, is intended to be installed on an inland waterways vessel this is a component of the vessel. The production date and placing on the market date of the module are irrelevant in respect of the emission regulation. For the purpose of transition the key dates are:

- the engine production date,
- the vessel production date (see question 5),
- the engine placing on the market date (see question 3),
- the vessel placing on the market date (see question 11).

Reference: Regulation (EU) 2016/1628, Article 4(1) under (5) and (6)

13 PREVIOUS STAGE ENGINES THAT WERE ALREADY PLACED ON THE MARKET

After the Stage V placing on the market date for the respective engine power category are there restrictions on the installation in vessels of engines that do not meet Stage V but that were produced prior to the Stage V placing on the market date and placed on the market in compliance with Regulation (EU) 2016/1628 or Directive 97/68/EC? This would include engines placed on the market but still in stock, for example at dealers or shipyards.

Regulation (EU) 2016/1628 in conjunction with Directive (EU) 2016/1629 and the associated ES-TRIN effectively prohibits the installation in a vessel of an engine that does not meet Stage V but that was already previously placed on the market in compliance with Regulation (EU) 2016/1628, Directive 97/68/EC or RVIR. ES-TRIN (Article 9.01(4)) fundamentally prohibits the installation of replacement engines (see question 4).

There are two exceptions:

- The engine complies with the definition of a transition engine (see question 6).
- or
- The engine complies with the transitional provisions laid down in ES-TRIN.

Consequences: The engines placed on the market but still in stock (ie CCNR II or EU Stage IIIA), for example at dealers or shipyards, were only installed within the framework of the transition engine scheme (valid no later than 2019 / 2021, see question 6).

References:

- *Regulation (EU) 2016/1628, Article 3(11), Article 58(5)*
- *ES-TRIN, Articles 9.01(4), 32.02, 32.05 and 33.02 in relation with Chapter 9*

14 CATEGORISATION OF BOW THRUSTER ENGINES

Are bow thruster engines, or auxiliary engines, used to power bow thrusters, considered as propulsion engines for Regulation (EU) 2016/1628?

Bow thruster engines with a reference power above 19 kW are deemed as propulsion engines.

However, if the bow thruster system is only capable of assisting steering, the use of either propulsion or auxiliary engine is permissible. The engine must be certified to the test cycles, available in the regulation for the category, in accordance with the use.

Installed bow thruster systems which are able to provide propulsion in fulfilling the provisions on making “steerageway under vessel’s own power” according to ESI-II-11 of ES-TRIN are not allowed to be operated by auxiliary engines.

Reference: Regulation (EU) 2016/1628, Article 3(24), Article 4(5), ES-TRIN, ESI-II-11



15 USE OF PROPULSION ENGINE FOR AUXILIARY POWER

May an engine of category IWP be used for auxiliary power?

Yes. There are two cases where that is permitted:

- If an engine is installed for the purpose of providing propulsion the regulation does not preclude the additional use of the engine to provide auxiliary power.
- An engine of category IWP may be installed in the place of an engine of category IWA solely to provide auxiliary power provided that it has been additionally tested on the appropriate cycle for the auxiliary operation, i.e. cycle D2 for constant speed auxiliary operation or C1 for variable speed auxiliary operation. The test cycles on which an engine has been type-approved are listed in section 1.12 of Part A of the type-approval information document.

Reference: Regulation (EU) 2016/1628, Article 4, Article 24(8)

16 ENGINES INTENDED TO USE IN THE PLACE OF IWP/IWA ENGINES

Which engines can be used in place of IWP of IWA engines?

1. An NRE category engine may be used in place of an IWA or IWP category engine if its power output is less than 560 kW. This engine shall comply either with the additional technical requirements in Appendix 1 or Appendix 2 of Annex IV of delegated regulation (EU) 2017/654. An NRE engine family not intended for exclusive use in inland waterway would indeed require type-approval according to Appendix 1 of Annex IV. However, as long as a particular NRE engine intended for exclusive use in inland waterway it fulfils the type-approval by following Appendix 2 of that Annex. If the whole family contains engines only used in inland waterways then Appendix 2 applies for the entire family, inclusive of the type-approval demonstration. If it were just one engine then just that engine would comply with Appendix 2.
2. An engine with an EU-EURO-VI certification for heavy goods vehicles under regulation 595/2009/EC or UNECE regulation R49-06 may also be used in place of an NRE category engine referred to in (1) provided that a technical service recognised under Regulation (EU) 2016/1628 recognises that this engine complies with the additional technical requirements referred to in (1).



Note 1: To fulfil Appendix 2 it is still necessary to comply with most parts of Appendix 1, the only difference being the removal of the inducement and replacement with logging in a non-volatile memory.

Note 2: These engines NRE or EU-EURO-VI shall also meet the requirements of Directive (EU) 2016/1629 or RVIR and the associated ES-TRIN relevant for the vessel application (especially the specific requirements concerning exhaust gas after treatment systems in Article 9.09).

Note 3: Marinisation may change the engine so that the type approval may need to be revised by the engine manufacturer or a new one issued. In addition, the company that makes the marinisation could, intentionally or unintentionally, become the manufacturer (see questions 17 and 18).

References:

- Regulation (EU) 2016/1628, Article 4(1)(b), Article 42
- Regulation (EU) 2017/654, Annex IV Article 3.6(b)(i), Annex IV appendices 1 and 2
- Regulation (EU) 2017/654, Annex XIII
- ES-TRIN, Article 9.09

17 MODIFICATION OF ENGINE

What type of modification to an engine is permitted without affecting type-approval?

A modification which does not involve changing emission-related parts or parameters, including drawings and descriptions, that are recorded in the information package of the type approval of the engine is permitted.

Additionally an engine must be installed in line with the engine manufacturer's instructions. Failure to do so could be considered as taking the engine out of compliance.

Where a legal person modifies an engine in such a way that it no longer complies with the emission limits applicable to it according to its category or sub-category, that person shall be considered to be responsible for re-establishing compliance with those emission limits.

Where an importer or distributor modifies an engine in such a way that its compliance with the applicable requirements may be affected, that importer or distributor shall be considered to be a manufacturer and would become fully responsible for all the obligations or a manufacturer including obtaining a type approval.

Where an OEM or body acting as an OEM (see question 10) does not follow the instructions of the manufacturer, or modifies an engine in the course of its installation in a manner that adversely affects the engine's performance with regard to its emissions, that OEM shall be considered to be a manufacturer and would become fully responsible for all the obligations or a manufacturer including obtaining a type approval.

The engine manufacturer may modify an engine in such a manner that it becomes a different approved type of that manufacturer, even if it subsequently qualifies to belong to a different category or sub-category. The engine manufacturer shall be responsible for ensuring that the engine complies with the requirements applicable to engine type that the engine is modified to, including the necessary emission markings.

The use of a fuel other than that specified in the information package also leads to a change in type-approval.

Reference: Regulation (EU) 2016/1628, Articles 8, 9 and 10



18 AMENDMENT OF TYPE-APPROVAL

What is the process to amend a type-approval?

A modification of an engine type that changes any of the particulars recorded in the information package, including fuel, drawings and descriptions, will require the type approval to be amended.

Only the engine manufacturer, as holder of the type-approval, can request such an amendment and it shall be from the type approval authority that originally certified the engine type. If the approval authority finds that, for the purposes of making an amendment, inspections or tests need to be repeated, it shall inform the manufacturer accordingly. Where particulars recorded in the information package have been changed, without requiring inspections or tests to be repeated, such an amendment shall be termed a 'revision'. In other cases it is termed an extension and will require indexing of the extension of the type approval number.

If production of the original engine type is to continue alongside the modified engine type then the modified engine type may need to become an additional engine type. In the case of an engine family, if the parameters of the modified engine type remain within those of the engine family, the additional engine type may be added to the engine family and retain the same type approval number with or without an indexing of the extension number depending on whether additional tests were required.

If there is not an engine family or the modified engine does not fit within the family parameters then a new type approval would need to be issued.

References:

- *Regulation (EU) 2016/1628, Articles 3(50), 8 and 27 in line with Chapter VI and*
- *Implementing Regulation (EU) 2017/656, Annex I including its Annexes*



19 RECREATIONAL CRAFT

How do the requirements of Regulation (EU) 2016/1628 apply to recreational craft other than those defined in the RCD (2013/53/EU)?

Engines for recreational craft that are not defined in EU Directive 2013/53/EU and not excluded from the scope of Directive (EU) 2016/1629 by virtue of normally operating on tidal waters and only temporarily operating on inland waterways, would be subject to the requirements of Regulation (EU) 2016/1628.

Reference: Regulation (EU) 2016/1628, Article 2

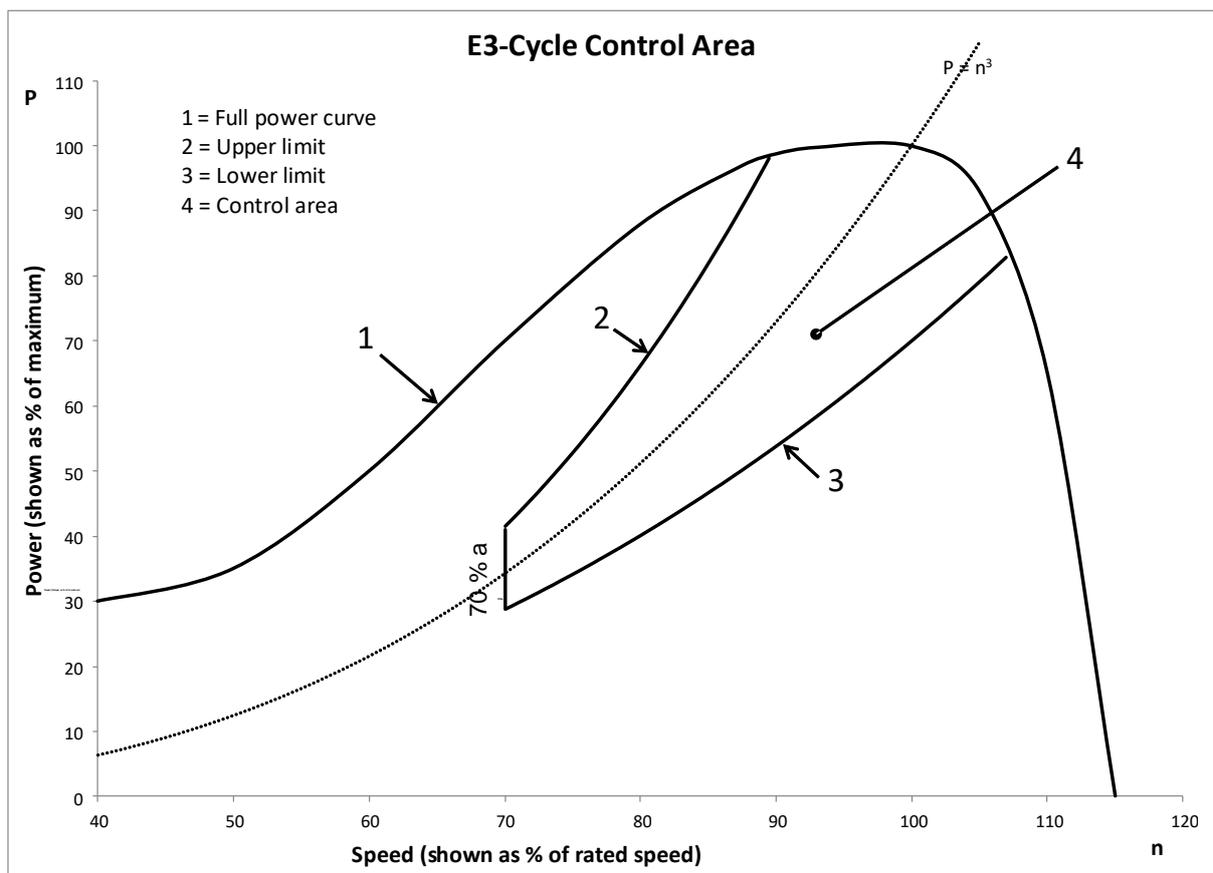
20 REDUCED POWER ENGINES

How shall reduced power engines be treated?

The rated net power certified in the type-approval documentation for the installed engine type shall be recorded in the engine parameter protocol regardless of the power required by the vessel.

It is not necessary that the power consumers or aggregation of power consumers connected to the installed engine absorbs the full power recorded in that documentation, but the installation must not constrain the engine to operate permanently at only speed and load points outside of the control area for the torque curve corresponding to the approved engine type or engine family. This means a combination of loads including, where applicable, the propeller load, that can be applied simultaneously must be able to achieve a speed and load point within the control area. Similarly, any vessel based control system must not permanently constrain the engine to operate outside the control area.

The engine manufacturer must provide information on the upper and lower boundaries of the control area applicable to the certified engine type to the engine installer. An example of the control area for a propeller curve operated engine is shown in the figure.



References:

- RVIR, administrative instruction No. 23
- Regulation (EU) 2016/1628, Article 24(6)

21 CONSTANT SPEED ENGINES WITH MORE THAN ONE SPEED

Can a constant speed engine have more than one speed?

An engine may have more than one constant speed. The requirements of Article 24(5) of Regulation (EU) 2016/1628 shall be met at each applicable constant speed. The information document of the engine emissions type-approval and corresponding installation instructions provided by the engine manufacturer shall indicate the applicable speeds for each type of engine.

The engine shall be shut-down prior to re-setting the engine controller to a different speed.

References:

- *RVIR, administrative instruction No. 23*
- *Regulation (EU) 2016/1628, Article 24(6)*



22 EXHAUST GAS AFTER TREATMENT SYSTEMS AND ENGINES

What are the combinations of engine and exhaust after treatment system allowed?

According to Regulation (EU) 2016/1628, where an after-treatment system is required to comply with the applicable emission limits it is part of the engine. The EU type-approval is granted for the complete system as a single unit. A single entity must take responsibility for the type-approval and placing on the market of that complete type-approved unit. Only combinations in compliance with the EU type-approval are allowed. It is not permitted to place on the market an engine without the necessary type-approval and to subsequently retrofit an exhaust after-treatment system without undergoing type-approval of the entire system according to the requirements of Regulation (EU) 2016/1628 and 2017/654.

Any additional after-treatment or other devices installed in the exhaust system would not be considered part of the emission control system of the engine and not be considered when inspecting an engine for conformance with type-approval to Regulation (EU) 2016/1628. Any additional equipment that is installed shall not contravene the engine manufacturer's installation requirements, for example exceeding exhaust back pressure limits.

Note: The transitional provisions according to question 6 must be observed. Until these deadlines, transition engines and exhaust aftertreatment systems can be purchased and installed separately. Separate retrofitting of exhaust aftertreatment systems to already installed engines is also permitted. In both cases the original engine emission stage is maintained – it is not a Stage V engine.

References:

- *ES-TRIN Article 9.09*
- *Regulation (EU) 2016/1628, Article 3(7) and 25, delegated Regulation (EU) 2017/654*

23 ENGINES USED AS PART OF AN INTEGRATED ELECTRICAL, HYBRID OR OTHER ALTERNATIVE PROPULSION SYSTEM

What are the certification requirements for an engine to be used in an integrated electrical (diesel electric), hybrid or other alternative propulsion system?

There are no special certification requirements for an engine used in this way. The engine is certified as an independent unit irrespective of whether it is directly connected to the propeller or provides power through an electric or other alternative power system, whether or not there is energy storage included in the system. If the system provides for the propulsion of the vessel the engine is certified as a propulsion unit even though the system may also provide auxiliary power independently of propulsion (see also question 15).

The engine(s) should be certified to the propulsion cycle, available in the regulation for the category, which most accurately represents the power absorption in use.

- If the engine runs at constant speed it should be certified to be the E2 cycle at that speed.
- If the engine is variable the engine should be certified to the E3 cycle.
- A variable speed NRE or EURO VI engines may be used in such a system.
- Constant speed NRE engines may only be used in a system where the engine runs at a constant speed the engine is certified for.

The engine must be installed in a system where the power adsorption curve passes through the control area for the engine (see also question 20).

Note: The use of NRE / EURO VI engines in place of IWP / IWA engines is described under question 16. Moreover, a dedicated guide for the procedure to marinise such engines was published by CESNI.

References

- *Regulation (EU) 2016/1628 Annex IV (table IV-5)*

24 CONFIRMING AN ENGINE IS APPROVED FOR THE APPLICATION THAT IT IS INSTALLED IN

How can it be determined that an engine has been approved on the correct test cycle(s) for its applications in the vessel?

All engines under stage V are delivered having been tested and approved to one or more test cycles. These test cycles determine the application(s) in which that engine may be installed. The attached table has been produced to be a handy reference to determine which applications an engine may be applied in depending on the test cycle(s) used for type-approval of the engine family.



It is of particular interest to note:

- An engine which performs direct or indirect propulsion duties should be certified to an IWP cycle, either constant speed or variable speed depending on its operation. Indirect propulsion includes diesel electric propulsion, including when the engine is being used to charging a battery that is used for propulsion.
- If tested on a suitable cycle an IWP engine may be used installed for an IWA only application.
- Regulation (EU) 2016/1628 specifies the E2 test cycle for category IWP engines controllable pitch propellers and electrically coupled (indirect) propulsion system on the basis that the installed engine will operate at, or close to, constant speed. Modern systems often work at a load dependent variable speed. In the case the propulsion engine will instead perform these duties operating at variable speed then the operation may be closer to operation on a fixed-pitch propeller curve and the E3 test cycle may be more representative. These are denoted by a '*' in the table. E2 and E3 are the only available propulsion test cycles for engines of category IWP. Type-approval on both cycles ensures the engine can be used in any propulsion application.

Questions 14, 15, 16 and 23 also cover this matter and, where relevant, should be reference in conjunction with the table.

Engine type-approval category	Engine speed operation	IWP test-cycles included in type-approval	IWA test-cycles included in type-approval (additional in case of IWP primary cycle)	NRE or Euro VI test-cycles included in type-approval	Installation purpose						
					Propulsion				Second use driving auxiliaries irrespective whether propulsion is engaged	Auxiliary	
					Direct propulsion (including bow thruster for any purpose)		Electrically coupled (indirect) propulsion (including bow thruster for any purpose)				
					Operates on a fixed-pitch propeller curve	Controllable-pitch propeller	Diesel-electric	Charging propulsion batteries			
IWP	variable	E3	None			Var. speed only*	Var. speed only*	Var. speed only*	Var. speed only		
			C1			Var. speed only*	Var. speed only*	Var. speed only*	Var. speed only	Var. speed only	
			D2			Var. speed only*	Var. speed only*	Var. speed only*		Const. speed only	
			C1 + D2			Var. speed only*	Var. speed only*	Var. speed only*			
		E3 + E2	None								
			C1								Var. speed only
			D2								Const. speed only
			C1 + D2								
	constant	E2	None					Const. speed only	Const. speed only	Const. speed only	
			D2					Const. speed only	Const. speed only	Const. speed only	Const. speed only
IWA	variable		C1								
	constant		D2							Const. speed only	
NRE < 560 kW	variable			NRTC + C1							
	constant			D2			Const. speed only	Const. speed only	Const. speed only	Const. speed only	
Euro VI < 560 kW				WHTC + WHSC							

References:

- Regulation (EU) 2016/1628, Article 4, Article 24 (5,7&8), Annex IV (Tables 5&6)
- Regulation (EU) 2017/656, Annex IX (1.1.1 & 1.1.2)

25 REPAIR OF ENGINES IN SERVICE

What provisions apply in case of engine repairs?

ES-TRIN 2023 introduces provisions for repair of engines in service, notably to respect the type-approval and to ensure that the identity of that repaired engine is traceable. The figure below gives an overview of the application of ES-TRIN, Chapter 9, by date of installation of the engine.

Date of installation of the engine	Before 2003	Between 2003 and 2007	Between 2007 and 2019*	After 2019*
Emission standard at the installation	None	RVIR (CCNR I) for the vessels with Rhine vessel inspection certificate.	RVIR (CCNR II) or EU Directive 97/68 (IIIA) for the vessels with Rhine vessel inspection certificate or Union certificate	EU Regulation 2016/1628 (NRMM, Stage V) as well as transition engines for the vessels with Rhine vessel inspection certificate or Union certificate
Technical requirements of Chapter 9 of ES-TRIN at the renewal of the vessel certificate	Only Article 9.02 of ES-TRIN (identification numbers of all internal combustion engines mentioned in the vessel certificate)	Chapter 9 of ES-TRIN, except Article 9.01(2) (if the engine still complies with the provisions on type approval and installation in force on the installation date)		Chapter 9 of ES-TRIN
Repairs	Article 9.10 does not apply	Article 9.10 applies only for repairs performed after 1 January 2024		

*2018 for < 300 kW engines

References:

- ES-TRIN, Chapter 9, Articles 32.02, 32.05 and 33.02 in relation with Chapter 9

