
EUROMOT POSITION

6 March 2015



Amendments to match COM proposal 2014(581) “Proposal for a regulation of the European Parliament and of the Council on requirements relating to emission limits and type-approval for internal combustion engines for non-road mobile machinery” inland waterways requirements with the EUROMOT position

Background to amendments

1. Propulsion engine limit values

The Euromot position is that the Commission proposal does not align with any international marine engine standard and has emission limits based on on-highway technology for truck sized engines. These emission limit values are not applicable in a marine installation due to restrictions on cooling system design, surface temperature limitations and safety concerns. With the high costs involved, a valid business case for developing unique products at an affordable cost for this niche EU market could not be established. Without new products the sector would be reliant on maintaining existing engines with associated higher emissions. An amendment is needed to align inland waterways propulsion engine emission limit values with US 40CFR1042 marine emission limit regulation, allowing engines developed for the US market to be supplied. This still provides an 80% reduction in emissions from current inland waterway propulsion engine emission limits.

The propulsion engine limit values are given in table II-5 of annex II of the proposed regulation and therefore this table needs replacing with one based on the US 40CFR1042 emission limit values. This is covered by amendment 8 in annex I of this document. To allow full alignment with the US the restriction in Article 4 - paragraph (5) point (a) that limits the regulated powers

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A Non Governmental Organisation in observer status with the UN Economic Commission for Europe (UNECE) and the International Maritime Organisation (IMO)

to >37 kW also needs to be removed. This is covered by amendment 2 in annex I of this document. The propulsion engine categories are in table I-5 in annex I of the proposed regulation and these need to be aligned with the new emission limit value table. This is covered by amendment 6 in annex I of this document.

2. Auxiliary engine limit values

Installed auxiliary engines have the same technology restricting installation limitations as propulsion engines. Due to this, engine manufacturers use substantially the same engine as the propulsion engine for auxiliary purposes and therefore the same emission limit values are applicable. The Commission proposal limits the category of engines where the propulsion and auxiliary limits are the same to >560 kW only. An amendment to Article 4 - paragraph (6) is required to expand this to all powers, which is consistent with the US legislation. This is covered by amendment 4 in annex I of this document.

The auxiliary engine limit values are given in table II-6 of annex II to the proposed regulation and therefore this table needs replacing with one replicating the propulsion emission limit values. This is covered by amendment 9 in annex I of this document. The auxiliary engine categories are in table I-6 in annex I of the proposed regulation and these need to be aligned with the new emission limit value table. This is covered by amendment 7 in annex I of this document.

3. Equivalence

There are several articles which allow engines with equivalent or lower emissions to be optionally used as an alternative. These also need amending to account for the proposed amendments above.

Article 4 - Paragraph (1) - point (b) allows the use of land based non-road engines in other applications where they have lower emissions, which is < 560 kW. Inland waterway auxiliary engines need to be added to this list since, while an engine installed in the hull using the ships cooling system cannot use this type of engine there are circumstances, such as a deck mounted crane or dredge excavator, where an air cooled radiator is used. Amendment 1 of annex I of this document achieves this.

Article 4 - paragraph (5) point (b) allows an inland waterways propulsion engine that has been certified to the correct cycle to be used as an auxiliary engine. This point needs amending to take account of the expansion of the power range where propulsion and auxiliary engines have the same emission limit values to all powers. This is covered by amendment 3 in annex I of this document. Article 23 point (8) also needs to be aligned with this principle. This is covered by amendment 5 in annex I of this document.

(Amendment proposals on both options in detail provided on the next pages)

EUROMOT – 2015-03-06

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Annex – Amendment in 2 column format

Amendment [1]

Proposal for a regulation

Article 4 - Paragraph (1) - point (b)

<i>Text proposed by the Commission</i>	<i>Amendment</i>
(b) engines with a reference power of less than 560 kW used in place of engines of categories IWP, RLL or RLR;	(b) engines with a reference power of less than 560 kW used in place of engines of categories IWA , IWP, RLL or RLR;

Justification

The proposed amendment [9] to table II-6 in annex II applies the same emission limit values as inland waterways propulsion engines to inland waterways auxiliary engines for all powers. This amendment will allow a land-based units of <560kW to optionally be used where they can be applied. These land based units have lower emission limit values than those proposed in the amendment to table I-6 in annex II.

Amendment [2]

Proposal for a regulation

Article 4 - paragraph (5) point (a)

<i>Text proposed by the Commission</i>	<i>Amendment</i>
(a) engines exclusively for use in inland waterway vessels, for their propulsion or intended for their propulsion, having a reference power that is greater than or equal to 37 kW,	(a) engines exclusively for use in inland waterway vessels, for their propulsion or intended for their propulsion.

Justification

There is no 37 kW minimum in the US regulation 40CFR1042. Removal of this exclusion allows full alignment with the US regulation.

Amendment [3]**Proposal for a regulation****Article 4 - paragraph (5) point (b)***Text proposed by the Commission*

(b) engines **with a reference power greater than 560 kW**-used in place of engines of category IWA subject to complying with the requirements of Article 23(8);

Amendment

(b) engines used in place of engines of category IWA subject to complying with the requirements of Article 23(8);

Justification

The proposed amendment [9] to table II-6 in annex II expands the application of the same emission limit values as inland waterways propulsion engines to inland waterways auxiliary engines from >560kW only to include all powers. This amendment aligns the text to allow an inland waterways propulsion engine that has been certified to the correct cycle to be used as an auxiliary engine in line with that principle.

Amendment [4]**Proposal for a regulation****Article 4 - paragraph (6)***Text proposed by the Commission*

‘Category IWA’, comprising engines exclusively for use in inland waterway vessels, for auxiliary purposes or intended for auxiliary purposes, **having a net power that is greater than 560 kW.**

Auxiliary engines for inland waterway vessels other than those having the characteristics set out in the first sub-paragraph shall be included in the categories NRE or NRS, according to their characteristics;

Amendment

‘Category IWA’, comprising engines exclusively for use in inland waterway vessels, for auxiliary purposes or intended for auxiliary purposes.

Justification

The proposed amendment [9] to table II-6 in annex II expands the application of the same emission limit values as inland waterways propulsion engines to inland waterways auxiliary engines from >560kW only to include all powers. This amendment aligns the text with this principle.

Amendment [5]

Proposal for a regulation

Article 23 point (8)

Text proposed by the Commission

In case of an engine of category IWP **having a reference power greater than 560 kW**-that is intended for use in place of an engine of category IWA in accordance with the second subparagraph of Article 4, the requirements of paragraph 5 shall be met separately for each applicable steady-state test cycle set out in both Tables IV-5 and IV-6 of Annex IV, and the type-approval information document shall indicate each steady-state test cycle for which this requirement was fulfilled.

Amendment

In case of an engine of category IWP that is intended for use in place of an engine of category IWA in accordance with the second subparagraph of Article 4, the requirements of paragraph 5 shall be met separately for each applicable steady-state test cycle set out in both Tables IV-5 and IV-6 of Annex IV, and the type-approval information document shall indicate each steady-state test cycle for which this requirement was fulfilled.

Justification

The proposed amendment [9] to table II-6 in annex II expands the application of the same emission limit values as inland waterways propulsion engines to inland waterways auxiliary engines from >560kW only to include all powers. This amendment aligns the text with this principle.

Amendment [6]**Proposal for a regulation****Table I-5 in annex I**

Text proposed by Commission

Table I-5: Sub-categories of engine category IWP defined in Article 4 point (5)

Category	Ignition type	Speed mode	Power range (kW)	Sub-category	Reference power
IWP	all	variable	$37 \leq P < 75$	IWP-v-1	Maximum net power
			$75 \leq P < 130$	IWP-v-2	
			$130 \leq P < 300$	IWP-v-3	
			$300 \leq P < 1000$	IWP-v-4	
			$P \geq 1000$	IWP-v-5	
		constant	$37 \leq P < 75$	IWP-c-1	Rated net power
			$75 \leq P < 130$	IWP-c-2	
			$130 \leq P < 300$	IWP-c-3	
			$300 \leq P < 1000$	IWP-c-4	
			$P \geq 1000$	IWP-c-5	

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Amendment Proposal

Table I-5: Sub-categories of engine category IWP defined in Article 4 point (5)

Category	Ignition type	Speed mode	Displacement	Power range (kW)	Sub-category	Reference power
IWP	all	variable	disp. < 0.9	P < 19	IWP-v-1	Maximum net power
			disp. < 0.9	19 ≤ P < 37	IWP-v-2	
			disp. < 0.9	37 ≤ P < 75	IWP-v-3	
			disp. < 0.9	75 ≤ P < 600	IWP-v-4	
			0.9 ≤ disp. < 1.2	P ≤ 600	IWP-v-5	
			1.2 ≤ disp. ≤ 3.5	P ≤ 600	IWP-v-6	
			3.5 ≤ disp. ≤ 7.0	P ≤ 600	IWP-v-7	
			all	P > 600	IWP-v-8	
		Constant	disp. < 0.9	P < 19	IWP-c-1	Rated net power
			disp. < 0.9	19 ≤ P < 37	IWP-c-2	
			disp. < 0.9	37 ≤ P < 75	IWP-c-3	
			disp. < 0.9	75 ≤ P < 600	IWP-c-4	
			0.9 ≤ disp. < 1.2	P ≤ 600	IWP-c-5	
			1.2 ≤ disp. ≤ 3.5	P ≤ 600	IWP-c-6	
			3.5 ≤ disp. ≤ 7.0	P ≤ 600	IWP-c-7	
			all	P > 600	IWP-c-8	

Justification

This amendment aligns propulsion engine categories with the proposed amendment [8]

Amendment [7]**Proposal for a regulation
Table I-6 in annex I**

Text proposed by Commission

Table I-6: Sub-categories of engine category IWA defined in Article 4 point (6)

Category	Ignition type	Speed mode	Power range (kW)	Sub-category	Reference power
IWA	all	variable	$560 \leq P < 1000$	IWA-v-1	Maximum net power
			$P \geq 1000$	IWA-v-2	
		constant	$560 \leq P < 1000$	IWA-c-1	Rated net power
			$P \geq 1000$	IWA-c-2	

Amendment Proposal**Table I-6: Sub-categories of engine category IWA defined in Article 4 point (6)**

Category	Ignition type	Speed mode	Displacement	Power range (kW)	Sub-category	Reference power
IWA	all	variable	disp. < 0.9	$P < 19$	IWA-v-1	Maximum net power
			disp. < 0.9	$19 \leq P < 37$	IWA-v-2	
			disp. < 0.9	$37 \leq P < 75$	IWA-v-3	
			disp. < 0.9	$75 \leq P < 600$	IWA-v-4	
			$0.9 \leq \text{disp.} < 1.2$	$P \leq 600$	IWA-v-5	
			$1.2 \leq \text{disp.} \leq 3.5$	$P \leq 600$	IWA-v-6	
			$3.5 \leq \text{disp.} \leq 7.0$	$P \leq 600$	IWA-v-7	
			all	$P > 600$	IWA-v-8	
		Constant	disp. < 0.9	$P < 19$	IWA-c-1	Rated net power
			disp. < 0.9	$19 \leq P < 37$	IWA-c-2	
			disp. < 0.9	$37 \leq P < 75$	IWA-c-3	
			disp. < 0.9	$75 \leq P < 600$	IWA-c-4	
			$0.9 \leq \text{disp.} < 1.2$	$P \leq 600$	IWA-c-5	
			$1.2 \leq \text{disp.} \leq 3.5$	$P \leq 600$	IWA-c-6	
			$3.5 \leq \text{disp.} \leq 7.0$	$P \leq 600$	IWA-c-7	
all	$P > 600$	IWA-c-8				

*Justification**This amendment aligns auxiliary engine categories with the proposed amendment [9]*

Amendment [8]**Proposal for a regulation
Table II-5 in annex II**

Text proposed by Commission

Table II-5: Stage V emission limits for engine category IWP defined in Article 4 point (5)

Emission stage	Engine sub-category	Power range	Engine ignition type	CO	HC	NOx	PM mass	PN	A
		kW		g/kWh	g/kWh	g/kWh	g/kWh	#/kWh	
Stage V	IWP-v-1 IWP-c-1	$37 \leq P < 75$	all	5,00	(HC+NOx \leq 4,70)		0,30	-	6,00
Stage V	IWP-v-2 IWP-c-2	$75 \leq P < 130$	all	5,00	(HC+NOx \leq 5,40)		0,14	-	6,00
Stage V	IWP-v-3 IWP-c-3	$130 \leq P < 300$	all	3,50	1,00	2,10	0,11	-	6,00
Stage V	IWP-v-4 IWP-c-4	$300 \leq P < 1000$	all	3,50	0,19	1,20	0,02	1×10^{12}	6,00
Stage V	IWP-v-5	$P > 1000$	all	3,50	0,19	0,40	0,01	1×10^{12}	6,00

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Amendment Proposal

Table II-5: Stage V emission limits for engine category IWP defined in Article 4 point (6)

Emission Stage	Engine sub-category	Displacement	Net Power range	Engine ignition type	CO	HC	NOx	PM mass	A
		(L/cyl)	kW		g/kWh	g/kWh	g/kWh	g/kWh	
Stage V	IWP-v-1 IWP-c-1	disp. < 0.9	P < 19	all	6.6 ⁽¹⁾	(HC+NOx≤7.5)		0.4	6
Stage V	IWP-v-2 IWP-c-2	disp. < 0.9	19 ≤ P < 37	all	5.5	(HC+NOx≤4.7) ⁽²⁾		0.3 ⁽²⁾	6
Stage V	IWP-v-3 IWP-c-3	disp. < 0.9	37 ≤ P < 75	all	5.0	(HC+NOx≤4.7) ⁽²⁾		0.3 ⁽²⁾	6
Stage V	IWP-v-4 IWP-c-4	disp. < 0.9	75 ≤ P < 600	all	5.0	(HC+NOx≤4.7)		0.14	6
Stage V	IWP-v-5 IWP-c-5	0.9 ≤ disp. < 1.2	P ≤ 600	all	5.0	(HC+NOx≤5.4)		0.12	6
Stage V	IWP-v-6 IWP-c-6	1.2 ≤ disp. ≤ 3.5	P ≤ 600	all	5.0	(HC+NOx≤5.6)		0.10	6
Stage V	IWP-v-7 IWP-c-7	3.5 ≤ disp. ≤ 7.0	P ≤ 600	all	5.0	(HC+NOx≤5.8)		0.10	6
Stage V	IWP-v-8 IWP-c-8	all	P > 600	all	5.0	0.19	1.8	0.045	6

(1) 8.0 g/kWh for ≤ 8 kw

(2) Optionally, these categories may be certified to a NOx +HC level of 5.8 g/kW.hr and a PM level of 0.2 g/kW.hr

Justification

The Commission proposal does not align with any international marine engine standard and has emission limits based on on-highway technology for truck sized engines. These emission limit values are not applicable in a marine installation due to restrictions on cooling system design, surface temperature limitations and safety concerns. With the high costs involved, a valid business case for developing unique products at an affordable cost for this niche EU market could not be established. Without new products the sector would be reliant on maintaining existing engines with associated higher emissions. This amendment aligns inland waterways propulsion engine emission limit values with US 40CFR1042 marine emission limit regulation allowing engines developed for the US market to be supplied, yet still provides an 80% reduction in emissions from current inland waterway propulsion engine emission limits.

Amendment [9]**Proposal for a regulation
Table II-6 in annex II**

Text proposed by Commission

Table II-6: Stage V emission limits for engine category IWA defined in Article 4 point (6)

Emission stage	Engine sub-category	Power range	Engine ignition type	CO	HC	NOx	PM mass	PN	A
		kW		g/kWh	g/kWh	g/kWh	g/kWh	#/kWh	
Stage V	IWA-v-1 IWA-c-1	$560 \leq P < 1000$	all	3,50	0,19	1,20	0,02	1×10^{12}	6,00
Stage V	IWA-v-2 IWA-c-2	$P \geq 1000$	all	3,50	0,19	0,40	0,01	1×10^{12}	6,00

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Table II-6: Stage V emission limits for engine category IWA defined in Article 4 point (6)

Emission Stage	Engine sub-category	Displacement	Net Power range	Engine ignition type	CO	HC	NOx	PM mass	A
		(L/cyl)	kW		g/kWh	g/kWh	g/kWh	g/kWh	
Stage V	IWA-v-1 IWA-c-1	disp. < 0.9	$P < 19$	all	6.6 ⁽¹⁾	(HC+NOx≤7.5)		0.4	6
Stage V	IWA-v-2 IWA-c-2	disp. < 0.9	$19 \leq P < 37$	all	5.5	(HC+NOx≤4.7) ⁽²⁾		0.3 ⁽²⁾	6
Stage V	IWA-v-3 IWA-c-3	disp. < 0.9	$37 \leq P < 75$	all	5.0	(HC+NOx≤4.7) ⁽²⁾		0.3 ⁽²⁾	6
Stage V	IWA-v-4 IWA-c-4	disp. < 0.9	$75 \leq P < 600$	all	5.0	(HC+NOx≤4.7)		0.14	6
Stage V	IWA-v-5 IWA-c-5	$0.9 \leq \text{disp.} < 1.2$	$P \leq 600$	all	5.0	(HC+NOx≤5.4)		0.12	6
Stage V	IWA-v-6 IWA-c-6	$1.2 \leq \text{disp.} \leq 3.5$	$P \leq 600$	all	5.0	(HC+NOx≤5.6)		0.10	6
Stage V	IWA-v-7 IWA-c-7	$3.5 \leq \text{disp.} \leq 7.0$	$P \leq 600$	all	5.0	(HC+NOx≤5.8)		0.10	6
Stage V	IWA-v-8 IWA-c-8	all	$P > 600$	all	5.0	0.19	1.8	0.045	6

(1) 8.0 g/kWh for ≤ 8 kw

(2) Optionally, these categories may be certified to a NOx +HC level of 5.8 g/kW.hr and a PM level of 0.2 g/kW.hr

Justification

Installed auxiliary engines have the same technology restricting installation limitations as propulsion engines. Due to this engine manufacturers use substantially the same engine as the propulsion engine for auxiliary purposes and therefore the same emission limit values are applicable. This is recognised in the US regulation 40CFR1042 which applies the same emission limit values to propulsion and auxiliary engines. This amendment aligns auxiliary engine emission limit values with those for propulsion engines given in amendment [8].

EUROMOT is the European Association of Internal Combustion Engine Manufacturers. It is committed to promoting the central role of the IC engine in modern society, reflects the importance of advanced technologies to sustain economic growth without endangering the global environment and communicates the assets of IC engine power to regulators worldwide. For more than 20 years we have been supporting our members - the leading manufacturers of internal combustion engines in Europe, USA and Japan - by providing expertise and up-to-date information and by campaigning on their behalf for internationally aligned legislation. The EUROMOT member companies employ all over the world about 200,000 highly skilled and motivated men and women. The European market turnover for the business represented exceeds 25 bn euros. Our **EU Transparency Register** identification number is **6284937371-73**.

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