



Co-financed by the European Union



Workshop: Can EURO VI engines solve Stage V NRMM requirements?

EURO VI engines equivalent to Stage V NRMM

Khalid Tachi

Gorinchem, May 9th, 2017

Stage V NRMM Regulation

Two parts:

A. Regulation (EU) 2016/1628 of September 14th, 2016

Requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery;

B. Delegated Regulation (EU) 2017/654 of December 19th, 2016

Supplementing Regulation (EU) 2016/1628 with regard to technical and general requirements relating to emission limits and type-approval for internal combustion engines for non-road mobile machinery.

Stage V NRMM Regulation: Equivalence (1/2)

Regulation (EU) 2016/1628

- i. Article 42 (3) =>
equivalence between Euro VI engines and Stage V engines of category NRE;
- ii. Article 4 (1), point (1)(b) =>
(Stage V) NRE engines <560kW can be used in place of Stage V IWP or IWA engines.

Equivalence means (from i. & ii.):

With type-approved Euro VI engine <560kW =>

no need for a separate type-approval granted under Regulation (EU) 2016/1628.

Equivalence between Euro VI and Stage V NRMM engines, category NRE

Regulation (EU) 2016/1628; Article 42(3) / 42(4)(b)

Article 42 ***Acceptance of equivalent engine type-approvals***

3. EU type-approvals granted on the basis of Union acts as listed in the delegated act referred to in point (b) of paragraph 4 shall be recognised as being equivalent to the EU type-approvals granted in accordance with this Regulation.
4. The Commission is empowered to adopt delegated acts in accordance with Article 55 supplementing this Regulation by setting out:
 - (b) the list of Union acts pursuant to which EU type-approvals are granted, including any requirements set out therein which relate to their application.

NRE engines <560kW in place of IWP or IWA engines

Regulation (EU) 2016/1628; Article 4(1) point (1)(b)

Article 4 **Engine categories**

1. For the purposes of this Regulation, the following engine categories, divided into the sub-categories set out in Annex I, apply:
 - (1) 'category **NRE**':
 - (b) *engines having a reference power of less than 560 kW used in the place of Stage V engines of categories **IWP, IWA, RLL or RLR**;*

Engine power limit <560kW

Category	Net Power	CO	HC	NOx	PM	PN
	<i>kW</i>	<i>g/kWh</i>				<i>1/kWh</i>
NRE-v/c-6	$130 \leq P \leq 560$	3.50	0.19	0.40	0.015	1×10^{12}
NRE-v/c-7	$P > 560$	3.50	0.19	3.50	0.045	-

No PN counting for NRE engines over 560kW!

Stage V NRMM Regulation: Equivalence (2/2)

Annex XIII to Delegated Regulation (EU) 2017/654

Euro VI engine (type-approved under Regulation (EC) No 595/2009) used in place of a Stage V IWP or IWA engine <560kW:

Additional obligation:

Fulfil the **additional** requirements set out in

Regulation (EU) 2017/654, **Annex IV, Appendix 2**,
to ensure the correct operation of NO_x control measures that apply for engines of categories IWP/ IWA, and **that this is being confirmed by a Technical Service.**

Conclusion

- **No need for a separate type-approval granted under Regulation (EU) 2016/1628 for a type-approved Euro VI engine used in place of a Stage V IWP or IWA engine <560kW.**
- An **additional arrangement** for a correct operation of NOx control measures/ after treatment system, **must be confirmed by a Technical Service**. E.g. the speed derating procedure should be adapted in the software for another procedure.
- EURO VI type approved engines can be used for inland navigation already **before 2019** on the grounds of Art 65(2), 2nd paragraph, under the **same conditions** related to the equivalency discussed here.