

## **Proposal for amendments to the 05 series of amendments to UN Regulation No. 96 (Emissions from Non-Road Mobile Machinery (NRMM) engines)**

The text reproduced below was prepared by the expert from CITA proposing to amend the 05 series of amendments to UN Regulation No. 96, improving the design of vehicles to make tampering of emissions systems more difficult and to facilitate its detection.

### **I. Proposal**

*Insert new paragraph 2.1.30., amend following numbering*

- “2.1.30. **"Engine protection" means measures to protect the engine in extreme rare situations, where the engine could be harmed although it has been designed, constructed and assembled according to 5.1. of this Regulation.;**“

*Paragraph 2.1.88., amend to read:*

- “2.1.88. "Tampering" means inactivation, **removal, disconnection**, adjustment or modification of the emission control system, including any software, other logical control elements **or components** of such a system, that has the effect, whether intended or not, of worsening the emissions performance of the engine; “

*Paragraph 4.3.6., amend to read:*

- “4.3.6. Where the statutory marking of the engine is not visible without removing parts, the vehicle manufacturer shall affix to the category T vehicle or the non-road mobile machinery, in a visible manner **without dismantling**, a duplicate of the marking provided by the manufacturer.“

*Paragraph 5.1. amend to read:*

- “5.1. **Engines and after treatment systems shall be designed, constructed and assembled so that their normal operation does not harm persons or the environment more than unavoidable.**

Engines **and after treatment systems** shall be designed, constructed and assembled so as to enable them to comply with the provisions of this Regulation.“

*Insert new paragraph 5.1.1.2.*

- “5.1.1.2. **The technical measures shall also contain measures against mechanical, electric or software tampering.**“

*Appendix 5, insert new paragraph 5.5.1.*

- “5.5.1. **For engine types and engine families that use an Electronic Control Unit (ECU) or emissions-related controller as part of the emission control system, the information**

**shall include a regularly updated list of approved emission control software versions (with integrity information for each)“**

*Annex 1, paragraph 1.9.1, amend to read:*

- “1.9.1. For engine types and engine families that use an Electronic Control Unit (ECU) or emissions-related controller as part of the emission control system the information shall include
- a description of the provisions taken to prevent tampering with and modification of the ECU including the facility for updating using a manufacturer-approved programme or calibration,
  - **a regularly updated list of approved software versions of emission-related controllers and their related integrity information, including necessary access information,**
  - **access and judgement information for emission-related sensor signals,**
  - **access and trigger information for emission-related actuators,**
  - **access and judgement information for parameters calculated by emission-related controllers;“**

*Annex 1 – Appendix A.3, Table, insert new paragraph 3.1.6.*

- “3.1.6. **approved emission control software versions (with integrity information for each)“**

*Annex 2 - Appendix A.1, insert new paragraph 2.4.*

- “2.4. **emission control software version (only for engines that use an Electronic Control Unit (ECU) as part of the emission control system)“**

## **II. Justification**

To avoid tampering, it is necessary to have additional requirements for design and behaviour of the systems.

To ensure that tampering at engines is detected during lifetime, e.g. in roadworthiness testing, it is necessary to provide additional requirements for access to and information about the systems and its components.