

Informal document GRPE-74-13  
74th GRPE, 9-13 January 2017,  
Agenda item 6(a)

# Joint Research Centre

the European Commission's in-house science service

*Serving society  
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Supporting legislation*



## Alignment of Regulation 96 to Regulation (EU) 2016/1628





# UNECE Regulation 96

on

Uniform provisions concerning the approval of compression ignition (C.I.) engines to be installed in agricultural and forestry tractors and in non-road mobile machinery with regard to the emissions of pollutants by the engine

- ❑ ***R96 covers only part of the scope of EU Stage V\* Regulation.***
- ❑ ***R96 includes in its scope T vehicles which will be subject to equivalent Stage V legislation, under development.***
- ❑ ***Need to align R96 limits to EU Stage V Regulation.***

\*Stage V = REGULATION (EU) 2016/1628



# Work Progress

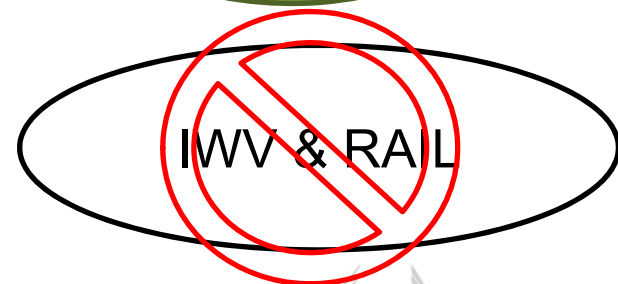
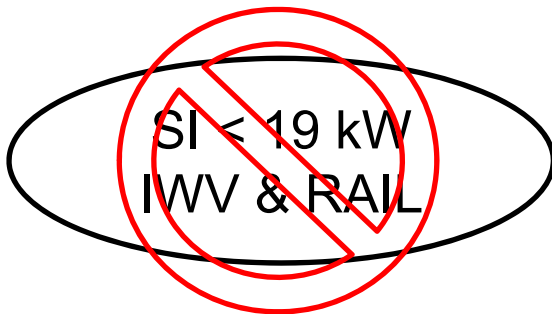
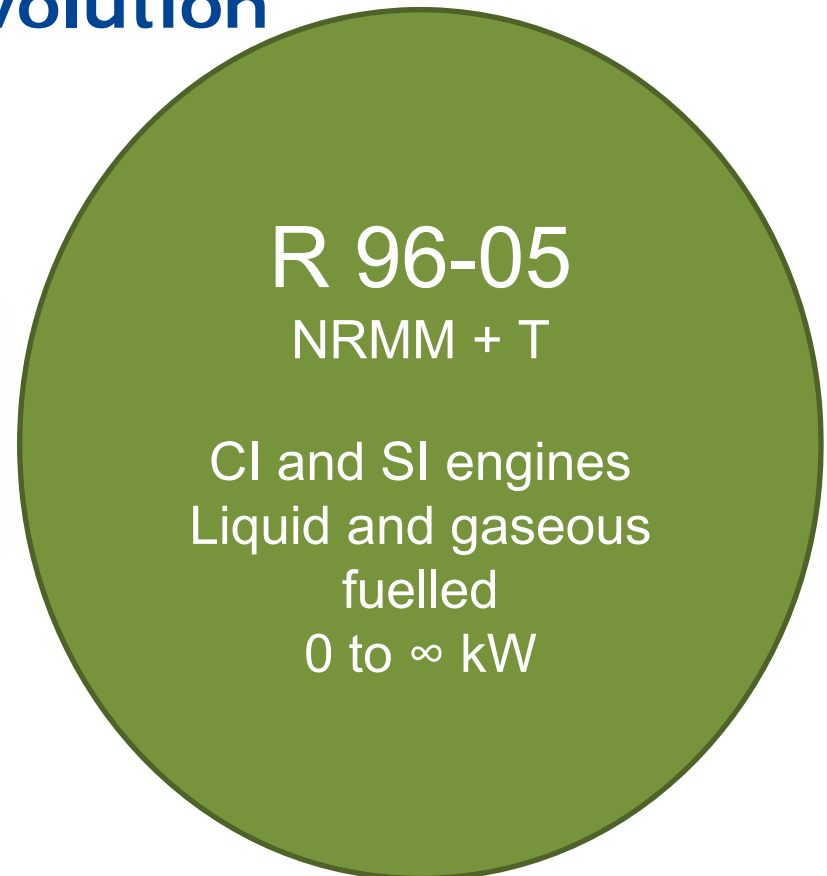
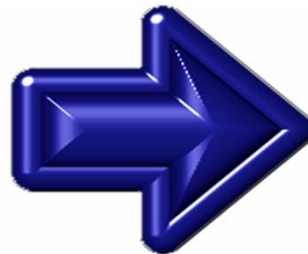
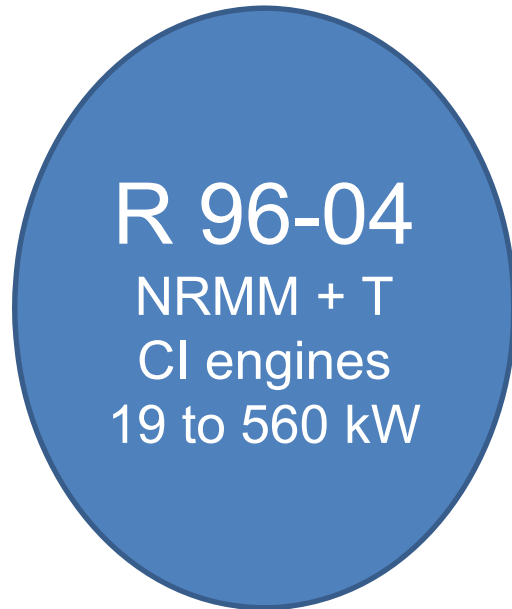
## Guiding principles of the 05 series of amendment

- Follow R96-04 structure
- Mirroring the scope of EU Stage V
  - I WV & Rail out of scope for WP29
- Keep R96 as a core Type Approval legislation
  - Exemptions and particular provisions to remain only in national/regional legislation
- Alignment of the R96 technical annexes to the EU Stage V Delegated and Implementing Acts.
  - Examples:
    - deletion of annex 4A in R 96
    - Addition of PN measurements

**The previous series of amendments remain in force for contracting parties wishing to apply them.**



## Scope Evolution



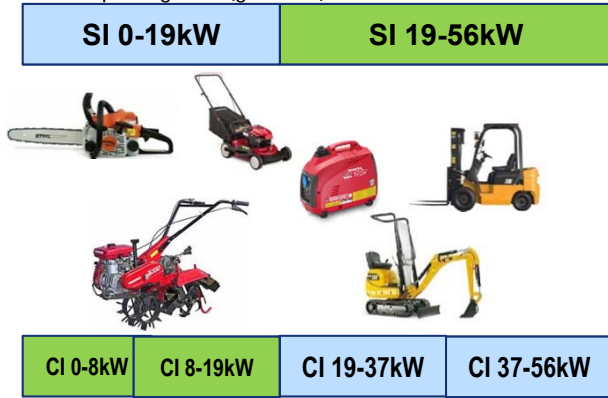
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# New NRMM Regulation

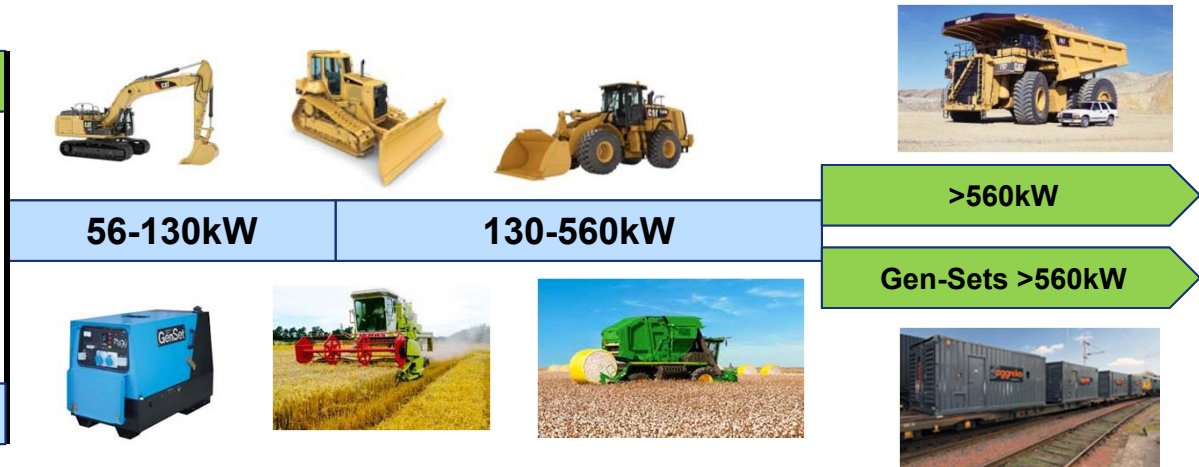
# Regulation (EU) 2016/1628

## Land-based NRMM

SI – Spark-ignited (gasoline)



CI – Compression-ignited (diesel)



## Rail - Locomotives



## Rail - Railcars



## Inland Waterway Vessels (IWV)



## Snowmobiles



## All Terrain & Side-by-Side Vehicles



Scope of Directive 97/68/EC

Scope extensions new NRMM Regulation



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# Contents

- 1 Scope
- 2 Definitions and abbreviations
- 3 Application for approval
- 4 Approval
- 5 Requirements and tests
- 6 Installation on the vehicle
- 7 Engine Family
- 8 Conformity of production
- 9 Penalties for non-conformity of production
- 10 Modifications and extension of approval of the approved type
- 11 Production definitively discontinued
- 12 Transitional provisions
- 13 Names and addresses of Technical Services  
responsible for conducting approval tests and of  
Type Approval Authorities



# Contents (cont.)

## Annexes

### 1 Information document No ... relating to the type approval

Appendix 1 Essential characteristics of the (parent) engine

Appendix 2 Essential characteristics of the engine family

Appendix 3 Essential characteristics of engine types within the family

Appendix 4 Parameters for the definition of engine types and engine families, and their operation modes

### 2 Communication

Appendix 1 Test report for NRMM engines

### 3 Arrangements of approval marks

### 4 Test procedure for compression-ignition engines to be installed in

Appendix 1 Particle number emissions measurement equipment

Appendix 2 Installation requirements for equipment and auxiliaries

Appendix 3 Verification of torque signal broadcast by the ECU

Appendix 4 Procedures for the measurement of ammonia

Appendix 5 Description of system response

Appendix 6 Characteristics of the steady-state and transient test cycles



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# Contents (cont.)

## 5 Method for data evaluation

Appendix 1 Drift Correction

Appendix 2 Carbon flow check

Appendix 3 Statistics

Appendix 4 1980 international gravity formula

## 6 Requirements for engines fuelled with reference fuels and any other specified fuels, fuel mixtures or fuel emulsions

Appendix 1 Technical characteristics of the reference fuels

Appendix 2 Summary of approval process for natural gas and LPG fuelled engines including dual-fuel engines

Appendix 3 Performance requirements and test procedures for dual-fuelled engines

Appendix 3.1 Dual-fuel engine dual-fuel indicator, warning system, operability restriction - Demonstration requirements

Appendix 3.2 Emission test procedure requirements for dual-fuel engines

Appendix 3.3 Types of dual-fuel engines operated on natural gas/biomethane or LPG and a liquid fuel – illustration of the definitions and main requirements





## Contents (cont.)

- 7 Measurements and tests with regard to the area associated with the non-road steady-state test cycle
- 8 Methodology for adapting the emission laboratory test results to include the deterioration factors
- 9 Requirements with regard to emission control strategies, NO<sub>x</sub> control measures and particulate control measures
  - Appendix 1 Additional technical requirements on NO<sub>x</sub> control measures for engines of categories NRE and NRG, including the method to demonstrate these strategies
  - Appendix 2 Technical requirements on particulate pollutant control measures, including the method to demonstrate these measures





# Timing



- ❑ **Planned to submit a first draft as informal document to next GRPE session (June 2017)**
- ❑ **Publication goal**
  - **In order to ensure adequate EU market alignment and contemporary EU and UN ECE approvals in view of Stage V, the new amendment should ideally be published in 2018.**
- ❑ **Regulation 120**
  - **Also Regulation 120 will need update to maintain alignment on some specific provisions like:**
    - **Accessories installed for engine power determination**
    - **Reference fuels**
    - **Information document**
  - **This can be done as a sister activity of the main one.**



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Acknowledgements to contributors such as Italy and EUROMOT



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