Ministerie van Infrastructuur en Milieu

World wide harmonised certification for retrofit after treatment systems

Dübendorf , 20 March 2015
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Legal framework

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

AGREEMENT CONCERNING THE ADOPTION OF UNIFORM TECHNICAL PRESCRIPTIONS FOR WHEELED VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED AND/OR BE USED ON WHEELED VEHICLES AND THE CONDITIONS FOR RECIPROCAL RECOGNITION OF APPROVALS GRANTED ON THE BASIS OF THESE PRESCRIPTIONS

Revision 2 (Including the amendments entered into force on 16 October 1995)

History of the new ECE Regulation on REC (1)

- Complaints by industry: too many different certification schemes
- Euro VI Regulation: Commission shall accommodate retrofitting
- Initiative by JRC. Several meetings of an informal working group, resulting in a blueprint for a certification scheme for traps, based on the philosophy of VERT: best available technology.
- Presented in Brussels, strongly rejected by ACEA and De. Too different from German Annex 27. No link to Euro standards.
- Proposal by Euromot in GRPE: certification scheme for traps for NRMM
- Simultaneous proposal by NL: certification scheme for traps for trucks and buses
- Both proposals combined, NOx-aftertreatment added (January 2010)
- Mandate decided by GRPE, approved by WP29 (March 2010)

History of the new ECE Regulation on REC (2)

- Result: Informal working group on REC (June 2010)
- Chaired by The Netherlands, secretariat by AECC
- Much input by Euromot, Germany, TÜV Nord, UK, CH, JRC.
- German Annex 27 used as a template
- Lengthy discussions how to deal with 2 kinds of technology, with very different performance.
- Solution: level 1 in original Regulation, level 2 in amendment 01.
- Again lengthy discussions on:
  - particle number requirements and evaluation of secondary emissions (wish by NL and CH)
  - requirements on increase of NO_2 (wish by D),
  - appropriate testcycles to guarantee good real life performance (wish by D and NL)

Contents of the new Regulation

- Objective: certified retrofit systems for upgrading emission levels of vehicles and machines (for NOx and or particulates) from a given Euro class or stage to a higher Euro class or stage
- Scope:
  - heavy duty on road vehicles with engines approved according to R49
  - machines and agricultural tractors with engines approved according to R96
- Engines for rail and IWT not within scope of R96 > excluded
- Aftertreatment systems for the reduction of particulates, NOx or both
- Additional requirements for NO_2, particle number, NOx reduction in urban driving conditions
- Planning: New Regulation (incl. Amendment 01) operational by the end of 2014 after approval by WP29 of amendment 01 in its June session.

Challenge: real life low emissions of NOx and Particulates

- Wall flow traps: filtering efficiency not sensative to test cycle or driving conditions

- SCR: very sensative to test cycle and driving conditions.

- Euro V: meeting the 2 g/kWh limit in the ETC guarantees by no means low real life emissions. Many on road measurements using PEMS in The Netherlands and elsewhere have shown that real world NOx emissions of Euro V are hardly any better than real world NOx emissions of Euro II and III.

- Euro VI trucks show excellent NOx emissions, some buses and delivery trucks less good, but large improvement over Euro V

Evaluation of real life NOx emissions

1. Engine test bed with appropriate test cycle
2. Chassis dyno with appropriate test cycle
3. Test the whole vehicle in its real life operation using PEMS. Proven. Accurate. But expensive and time consuming installation of test equipment.
4. **New:** Test the whole vehicle in its real life operation using **SEMS**

- **SEMS** uses sensor technology measuring concentrations rather than emissions.
- Evaluating NOx emissions by calculating the ratio between NOx concentrations and CO_2 concentrations, a good measure for the real life NOx emissions.
- Developed by TNO at the request of the ministry
- A bit less accurate, but much less expensive, therefore more and extended measurements possible, during normal operation of the vehicle.

The new Regulation

Addendum 131 – Regulation No. 132

Date of entry into force as an annex to the 1958 Agreement: 17 June 2014

Uniform provisions concerning the approval of Retrofit Emission Control devices (REC) for heavy duty vehicles, agricultural and forestry tractors and non-road mobile machinery equipped with compression ignition engines

The new Regulation, revision 1

Addendum 131 – Regulation No. 132

Revision 1

01 series of amendments to the Regulation: Date of entry into force: 22 January 2015

Uniform provisions concerning the approval of Retrofit Emission Control devices (REC) for heavy duty vehicles, agricultural and forestry tractors and non-road mobile machinery equipped with compression ignition engines

Main contents of revision 1

- More stringent requirements for PM mass reduction (≥ 90%)
- Additional requirement for PM number reduction (≥ 97%)

Where to find the new Regulation

http://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/updates/R132r1e.pdf

So far applied by the Czech Republic, Switzerland and The Netherlands.
http://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/ECE-TRANS-WP.29-343-Rev.23.pdf

Thank you for your attention