

Progress report by the Chair of the informal group on REC

Geneva, 62nd GRPE

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General approach (1)

The group decided to start its work on retrofit devices reducing the emission of particulates. Germany offered to prepare a first draft Regulation, following the approach of Annex 27 to the German Road Traffic Regulations.

Requirements and procedures for the approval of devices reducing NO_x would be added at a later stage, being coordinated by the chair and AECC and seeking cooperation with UK and Swiss activities on the certification of retrofit NO_x reduction systems.

Different stringency levels (1)

Under the 1958 Agreement it is generally not possible to have two or more different stringency levels in one Regulation to be applied simultaneously, except for a transitional period between successive series of amendments.

The aims of the project is to test and approve systems that are able to upgrade Euro II, III, IV and V engines to the limit values of Euro III, IV, V and VI engines, and similar steps for engines approved according to Regulation 96, for NOx and/or Particulate Matter.

Different stringency levels (2)

Since the steps between different pollution class limit values of successive series of amendments differ, different technologies, having different reduction capabilities, may be applied to bridge these different steps.

To realise a suitable approach for a retrofit emission control device (REC) regulation the informal group evaluated different ways how to handle these different capabilities within the legal framework of the 1958 Agreement.

Different stringency levels (3)

- A separate Regulation for each stringency level and also for PM and NOx;
- Start with the lowest stringency level, and amend that soon afterwards with more stringent limit values and/or procedures, leaving it up to contracting parties which series of amendments to apply on their territory.
- Have one very high stringency level only, capable of bringing any engine up to the level of the most stringent series of amendments of Regulation 49 and 96.
- Have two or more implicit stringency levels in parallel in a way that is not in conflict with the principles of the 1958 agreement.

General approach (2)

- ▶ After detailed discussions the informal group reached consensus to work on an approach including different reduction capabilities, implicitly applying different stringency levels while considering the requirements of the 1958 Agreement.
- ▶ This consensus approach takes into account that contracting parties have to recognize all kinds UN/ECE approvals, but may choose to accommodate the use of exclusively the most stringent requirements in their national schemes e.g. for restrictions on the use of vehicles and machines and the granting of incentives for retrofit.

General approach (3)

The consensus approach of the informal group is also in line with the work so far (based on German Annex 27):

1. Evaluating the capability of a REC to reduce the emission of particulates and/or NO_x of a diesel engine to meet the limit values for particulates and/or NO_x of a more stringent series of amendments to Regulation 49 or 96.
2. Adding an additional minimum reduction requirement preventing the approval of systems with just low efficiency in case of engines that are already close to the limit values of the next higher series of amendments.
3. Additional requirements concerning the formation of unwanted secondary emissions like NO₂, possibly resulting in different approvals for systems with a restricted increase in NO₂ and systems with no increase of NO₂ at all.

General approach (4)

Implications of consensus approach on current REC draft:

REC requirements will be defined in the annexes to the draft Regulation, each dealing with specific requirements for a sort of REC for a specific application (PM only, NOx only, combined PM/NOx), and for different engine applications (Euro II > Euro III, Euro III > Euro IV/V etc.)

Question to GRPE

Can GRPE support the approach of the REC informal group how to handle implicitly different stringency levels by adding annexes to the Regulation, each dealing with the requirements and test procedures for a retrofit device for a specific application?

Solved Issues

- The operator of the vehicle or machine is responsible for its continued safe operation in accordance with the applicable legislation. The installation of the retrofit system shall not compromise this safety.
- The maximum exhaust gas back pressure prescribed by the manufacturer of the engine and stated in its type approval documents shall be respected by the retrofit system.
- Retrofit systems shall not interfere with the operation of the original engine and its OEM after treatment systems.

Outstanding issues (1)

- Do we need a particle number requirement to evaluate the efficacy of wall flow type particle filters also for upgrades to less than Euro VI?
- How much extra NO₂ do we accept in case of filters with regeneration with the help of NO₂? There seems to be support for the CARB figure of 20%
- Do we want to discriminate between filters with a limited increase in NO₂ and filters with no increase of NO₂ at all?
- How do we guarantee effective operation of DeNO_x systems in practical (urban) conditions of use, for some of which the ETC and ESC test cycles have shown poor representativeness?

Outstanding issues (2)

- How do we prevent or control the unwanted formation of toxic substances due to catalytic chemistry in traps or catalytic converters without creating too much expensive testing burden on manufacturers?
- What kind of monitoring, data logging and OBD provisions shall be applied, including NOx control?

Meetings so far (1)

- ▶ The informal group had its **first** meeting in conjunction with the 60th GRPE on 7 June 2010. This meeting was largely spend on discussing the draft mandate of the group and the general approach and planning.
- ▶ A **second** meeting was held in Brussels on 27 September 2010. It was spend on a final review of the mandate and on the identification of outstanding issues.
- ▶ A **third** meeting was held in conjunction with the 61st GRPE on 11 January 2011. A first draft Regulation was presented and discussed.

Meetings so far (2)

- ▶ A **fourth** meeting was held in Brussels on 31 March 2011. It was largely spend on discussing the draft Regulation and some outstanding issues.
- ▶ A **fifth** meeting was again held in Brussels on 11 May 2011. It was spend on further discussing the draft Regulation and outstanding issues.
- ▶ A **sixth** meeting was held in Geneva on 6 June 2011 in conjunction with this GRPE. It was spend on discussions on the general approach and some outstanding issues.

Further meetings and planning

- ▶ Further meetings are being planned for September, at JRC in Ispra, Italy, (tentative dates 20 and 21 September), and in November, possibly in The Hague (Netherlands)
- ▶ for REC September meeting a first draft on DeNOx requirements shall be prepared and discussed.
- ▶ It is the aim of the informal group to present for consideration a first draft Regulation to GRPE during its 63rd meeting in January 2012, and a final draft Regulation during its 64th meeting in June 2012.