

German comments on 1st draft for

Regulation for retrofit emission control systems for engines used in heavy duty vehicles, nonroad mobile machinery and agricultural tractors

1. Definitions

3 Retrofit emission control device (REC) classes should be foreseen, as formulated in the current REC proposal:

“Class [A] retrofit emission control device (REC)” means a retrofit emission control device with respect to particulate matter emissions only which does not significantly [level to be determined!] increase the direct NO₂ emissions¹.

“Class [B] retrofit emission control device (REC)” means a retrofit emission control device with respect to particulate matter emissions and NO_x emissions and thus NO₂ emissions¹.

“Class [C] retrofit emission control device (REC)” means a retrofit emission control device with respect to NO_x emissions only.

Justification:

With regard to European air quality requirements (especially on NO₂) particle retrofit systems need to comply with additional NO_x requirements, especially regarding the increase of direct NO₂ emissions. Based on corresponding experiences an appropriate level of NO₂ could be determined at a later stage. Therefore the NO₂ measurement procedure of the German Umweltbundesamt should be used (s. attached file to this document, will also be uploaded to GRPE homepage).

2. Fuels

Market fuels in accordance with the fuel specifications in place at the time of the REC approval testing should be used. On request of the manufacturer the use of reference fuels in accordance with regulation Euro VI (as proposed in “Draft **Commission Regulation (EU) No .../..** of [...] implementing and amending Regulation (EC) No 595/2009 of the European Parliament and of the Council on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information”) could also be made possible.

Justification:

The functioning of the retrofit systems should be proved under normal conditions. Therefore market fuels - or on request of the manufacturer adequate reference fuels - should be used for testing.

3. Emission requirements

a) Reduction levels

Currently 4 reduction levels are proposed both for NO_x and PM. Considering this it should be evaluated:

¹ NO₂ emissions to be measured with method of the German Umweltbundesamt (s. attached file to this document, will also be uploaded to GRPE homepage).

- Whether it is possible to reduce the number of reduction levels to simplify the REC system without lowering environmental standards?
- Whether a reduction level of 95% for NOx is fully technically feasible?
- How an additional particle number limit could be laid down?

The retrofit on Euro VI emission limits needs to be further evaluated. F.i. different driving cycles, further requirements on NOx-control, OBD need therefore to be taken into account.

The reduction levels should be applied on engine raw emission.

b) Additional compliance with emission limit(s)

In addition to relative reduction according to the reduction levels also compliance with at least the corresponding emission limit of next better emission stage from European or UN/ECE regulations is necessary. Therefore the system of German Annex XXVII [30th Order amending the German Road Traffic Approval Order (StVZO), see also REC-02-07] should be applied.

The used test engine may **not** comply with the emission limits of a higher emission stage before retrofit.

Justification:

To comply with the system of European/ECE emission regulation and to set ambitious requirements for the REC it is necessary to apply both relative reduction requirements and additional compliance with dedicated emission limits. Also the emission performance of the test engine before retrofit needs to be taken into account.

4. NOx-control

NOx retrofit systems like SCR require the use of additives (f.i. urea) to reduce NOx emissions. To ensure both the availability and quality of used urea - and this way the continuous function of the REC - NOx levels need to be monitored against partial and total failure. Also other NOx reduction systems (EGR, NSC) need to be monitored. The possibility of use of driver inducement and driver warning systems should be evaluated.

Justification:

As seen especially in the discussion of new European emission stage Euro VI the use of NOx-control devices and NOx monitoring is very important and should therefore be taken into account also for REC.

5. Use of additives

In case of use of additives for the REC, a certificate of clearance from [to be determined!] with respect to the system in conjunction with the additive used is to be submitted to the centre commissioned to perform the assessment. Especially additives containing Cu and Pt need to be further examined. In Germany the Umweltbundesamt is responsible for certificates of clearance in the context of Annex XXVII.

6. Secondary emissions

Secondary emissions are all compounds which were not present in significant concentrations in the exhaust gas of the test engine before retrofit. Secondary emissions of REC could be measured f.i. on basis of Suisse VERT procedure or comparable measurement procedures. Emission limits for secondary emissions need to be determined at a later stage.