OICA/Euromot Proposal on NOx Control Measures

Background:

The informal group on REC had asked OICA and Euromot to submit a proposal on NOx control measures, which should be based on the Euro VI and Nonroad Stage IV NOx control provisions. While the general requirements of the NOx control system and of the operator warning concept can be copied from the above regulations to a high degree, the operator inducement concept need to follow a different approach. The major reason is that section 12 of the current REC draft version does not permit the REC manufacturer to modify the original emission control system. It is therefore necessary and appropriate to establish an inducement system that does not need to directly interfere with the engine.

In order to find a broad consensus between engine/vehicle industry and contracting parties from the beginning, the following proposal was developed together with Germany.

1. General requirements

A NOx REC shall meet the following requirements:

- detailed information to the OEM and vehicle/machine operator
- maintenance requirements in line with Euro VI and Stage IV
- information that operation without reagent is illegal and invalidates type approval
- NH3 concentration to not exceed 25 [10] ppm
- heated system or inducement with non-heated system, in case reagent is not available within 70 minutes
- reagent level indicator to be installed
- reagent quality to be monitored continuously (NOx sensor, reagent quality sensor or equivalent)
- reagent consumption to be monitored (to be further discussed)
- have a non-erasable memory with standardized connector and access (e.g. SAE J1939)

2. Operator warning system

The operator warning system shall be largely based on the Euro VI and Nonroad Stage IV NOx control provisions. The operator warning system shall use visual alarms that inform the operator when a low reagent level, incorrect reagent quality, interruption of dosing or a system malfunction that may be attributed to tampering has been detected. The operator warning system may consist of one or more lamps, or display short messages.

3. Operator inducement system

The operator inducement system is proposed to interrupt the starter current (constant current, Terminal 30). A specific interruptor switch is connected to the NOx control system software. In order to make tampering of the inducement system more difficult, connector installation is using break away safety devices (shear bolts or similar).

Sequence of operator warning and inducement:

1. Failure detection: visual warning
2. 10 hours after detection: audible warning in addition to visual warning (= early inducement)
3. between 10 hours and 19 hours: escalation of visual and audible warnings
4. 19 hours: highest warning/early inducement level (➔engine will not start after shut off)
5. 20 hours: engine starter current interrupted
6. After shut down, no engine start possible for 5 hours
7. If failure is not corrected, 18 hours warning/early inducement level and engine starter current interrupted after 2 hours
8. After shutdown, no engine start possible for 48 hours