ASSOCIATION FOR EMISSIONS CONTROL BY CATALYST

A ROBUST AND TRANSPARENT 4TH PACKAGE ON REAL-DRIVING EMISSIONS (RDE)

Position Paper – November 2017

With the first three regulatory packages on Real-Driving Emissions (RDE) published as Commission Regulations (EU) 2016/427, (EU) 2016/646, and (EU) 2017/1154, the European Commission is now developing a proposal for a 4th RDE regulatory package aimed at increasing the robustness of the European emission legislation for cars and light commercial vehicles.

The emissions control industry that AECC represents welcomes this 4th RDE package and believes that the RDE procedure should be realistic and as pragmatic as possible to ensure it is robust and transparent to deliver the air quality benefits needed by citizens, local authorities, and EU Member States.

The 4th RDE package, as the final RDE regulatory element of the Euro 6 standard, will address in particular In-Service Conformity (ISC) and third-party testing provisions for market surveillance, the review of the PEMS data evaluation methods, and the RDE evaluation of Plug-in Hybrid Electric Vehicles (PHEV).

AECC's position on these three key elements is as follows:

In-Service Conformity (ISC) and third-party testing provisions for market surveillance

As proposed by the European Commission, In-Service Conformity testing under the responsibility of the Granting Type-Approval Authority needs to be complemented by market surveillance activities in EU Member States to ensure that Euro 6d cars and vans comply with RDE legislation and deliver the expected air quality benefits. AECC would encourage exchanges between Member States on vehicle models tested to help avoid duplication of effort and give a broader coverage of the EU fleet.

Independent, third-party testing should be performed only by accredited labs and under the guidance on PEMS testing developed by the Joint Research Centre (JRC) of the European Commission. The proposed standardization of PEMS equipment will also enhance robustness of the RDE procedure and is supported by AECC.

In order to allow proper market surveillance, including adequate third-party testing, AECC supports the definition by the European Commission's Transparency Task Force of an exhaustive list of information on individual vehicles that is required to carry-out WLTP and RDE tests.

Review of the PEMS data evaluation methods

As proposed by the European Commission, the Moving Average Window (EMROAD) tool can be retained to verify "RDE trip normality" but reporting of raw tailpipe NOx and PN emissions of an RDE test should be implemented as soon as is practical to ensure robustness and transparency.

Complementary dynamic driving boundary conditions (Appendices 7a and 7b to Annex IIIA of Regulation (EU) 2017/1151) were included in the second RDE package. These were added to the original PEMS data evaluation tools, the CO_2 Moving Average Window (MAW or EMROAD) method in Appendix 5 of Annex IIIA and the Power Binning (CLEAR) method in Appendix 6. Both complementary dynamic driving boundary conditions and data evaluation tools aim at preventing that RDE tests are driven in a biased manner (either too aggressive or too smooth).

However, it was observed, also in AECC RDE test programmes[1], that both data evaluation methods, EMROAD and CLEAR, can act in opposite directions. Contradicting tools introduce a degree of uncertainty and unpredictability in legislation. The European Commission proposal to retain the MAW tool which compares on-road CO_2 emissions to the WLTP lab reference will allow to check the RDE trip normality, providing the CO_2 band is set appropriately around the WLTP characteristic curve, based on available data gathered by the JRC.

The engine-out correlation between regulated pollutants and CO_2 emissions is minimized (or eliminated) at the tailpipe by state-of-the art aftertreatment technologies. This decoupling has recently been shown by the JRC on a Euro 6 diesel vehicle fitted with a combination of advanced deNOx systems and is also visible in the AECC RDE testing data. As a consequence, normalising pollutant emissions by the ratio of CO_2 in WLTP and RDE tests will introduce undesirable artefact.

RDE evaluation of Plug-in Hybrid Electric Vehicles (PHEV)

At type-approval of PHEVs, only a limited number of operating modes and battery state-of-charge will be evaluated on RDE. However, for market surveillance and real-world impact, it must be possible to assess their RDE performance under any combination of operating mode and battery state-of-charge.

AECC has conducted[2] an extensive test programme on a PHEV and highlighted the wide variety of conditions under which such vehicles can be operated. PHEVs can deliver zero tailpipe emission in urban areas, within the electric range, when they are driven in electric mode and if the battery has been fully charged. Outside of these conditions, higher emissions can be observed compared to a reference Gasoline Direct Injection car. On the PHEV tested the high spikes of Particle Number observed at the cold-start of the internal combustion engine were well controlled by a Gasoline Particulate Filter (GPF).

In the 3rd RDE package, different RDE data evaluation methods have been established for conventional vehicles and PHEVs. AECC believes that a technology-neutral approach is needed and this would be ensured by reporting raw emissions data for RDE.

Should you need more information, you can contact AECC at info@aecc.eu.

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References:

[1] Euro 6 Vehicles' RDE-PEMS Data Analysis with EMROAD and CLEAR, Demuynck et al., 6th International MinNOx Conference, Berlin, June 2016, www.aecc.eu//wp-content/uploads/2016/08/160622-AECC-MinNOx-PEMS-analysis.pdf

[2] Real-Driving Emissions from a Plug- in Hybrid Electric Vehicle (PHEV), Demuynck, 5th International Conference Real Driving Emissions, Berlin, October 2017, www.aecc.eu/wp-content/uploads/2017/10/171017-18-AECC-PHEV-programme-IQPC-RDE-final.pdf

AECC is an international non-profit scientific association of European companies operating worldwide in the research, development, testing and manufacture of key technologies for emissions control. Their products are the ceramic substrates for catalysts and filters; catalysts (substrates with catalytic materials incorporated or coated); adsorbers; filter-based technologies to control engine particulate emissions; and speciality materials incorporated into the catalyst or filter. Members' technology is integrated in the exhaust emissions control systems of cars, commercial vehicles, buses, non-road mobile machinery and motorcycles in Europe. More information on AECC can be found at www.aecc.eu.

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