

## THE EUROPEAN REAL-DRIVING EMISSIONS REGULATION

Beginning in 2017, the European Union's emissions type-approval procedure for passenger cars will include a new Real-Driving Emissions (RDE) test conducted using on-board portable emissions measurement systems (PEMS). The RDE regulation is a key policy to address high real-world emissions of nitrogen oxides (NO<sub>x</sub>) from diesel cars, but its success will depend on the ability of regulators to adjust its stringency level to drive changes in emissions control technology.

The Volkswagen defeat device scandal related to NO<sub>x</sub> emissions has led many to question whether "clean diesel" is a misnomer. Setting the bar too low for the RDE test will not dispel that doubt, and it will effectively penalize manufacturers using the best available NO<sub>x</sub> control technologies. RDE provisions should reflect the state of the art in emissions control technology, and be progressively reviewed until real-world emissions and legal emission limits are in line, as is already the case for most regulated pollutants.

### BACKGROUND

Since September 2015, new diesel passenger cars registered in the EU must meet the Euro 6 standard, which limits NO<sub>x</sub> emissions to 80 milligrams per kilometer. This is down from a 180 mg/km limit under the preceding Euro 5 standard. But these limits apply to an outdated measurement protocol (New European Driving Cycle, NEDC), and they are not supported by on-road compliance and enforcement requirements for in-use vehicles. As a result, the large majority of passenger cars certified to the Euro 6 standard have NO<sub>x</sub> emission levels several times above the regulated limit when driven under normal conditions. Also, a minority of the latest generation of diesel vehicles become gross polluters as soon as they are tested outside the narrow boundary conditions of the official emissions test, in spite of being equipped

with dedicated systems that could control NO<sub>x</sub> under a broad range of driving conditions. This does not necessarily signal the presence of defeat devices, but it does indicate a failure of the Euro 6 standard to ensure that manufacturers properly calibrate engine and aftertreatment devices to achieve low real-world NO<sub>x</sub> emissions from diesel cars.

On October 28, 2015, a meeting of the Technical Committee on Motor Vehicles (TCMV) was held in Brussels. At this meeting, representatives of all EU Member States had a chance to make modifications or adjustments to the latest draft proposal for an RDE regulation that the European Commission had put forward with the participation of all stakeholders, including EU Member States, vehicle manufacturers and suppliers, technical services and environmental NGOs.<sup>1</sup> At this meeting, the TCMV decided to modify the RDE text to substantially relax the requirements of the on-road tests. Specifically, the conformity factor (i.e., the multiplier used to calculate the allowable emissions during the on-road test with respect to the Euro 6 limit) was raised from 1.6 to 2.1 for the first stage of application of the regulation, and from 1.2 to 1.5 for the second phase. The second, "final" conformity factor was also delayed one year in its application, from 2019 to 2020. In other words: after the RDE regulation is fully phased in, diesel passenger cars will be allowed to emit 50% more NO<sub>x</sub> than the Euro 6 limit—a limit that is already higher than the one applicable to their gasoline counterparts.

### THE CASE FOR A STRONG RDE

Independent test results published by the ICCT and other researchers have shown that some Euro 6 diesel passenger cars are already achieving low on-road

<sup>1</sup> The technical work of the stakeholder groups, to which ICCT is a contributor, dates as far back as 2011.

emission levels using current NO<sub>x</sub> control technologies. Conformity factors as high as those proposed by the TCMV are therefore not warranted by the state of the art in vehicle emissions control and measurement technology. Allowing such high conformity factors undermines the effectiveness of the RDE regulation in reducing the gap between laboratory and on-road NO<sub>x</sub> emissions from diesel cars as rapidly as current technologies will allow.

Scientific evidence has repeatedly shown that robust emission regulation frameworks can drive the adoption of the most effective technologies. If the RDE is to effectively drive technological improvements to the pollution control systems installed in diesel cars, certain revisions should be made to the regulation concerning not just the conformity factors, but also how test vehicles are obtained, how the on-road tests are conducted, and how the test results are disseminated.

## STRENGTHENING THE RDE

The European Parliament has until January 2016 to evaluate (and eventually ask for a reconsideration of) the RDE text that came out of the TCMV meeting. Against this background, there are five specific actions that should be taken to strengthen the RDE regulation:

1. Expand the focus of the RDE regulation from type-approval only (i.e., only testing pre-production, specially prepared vehicles, the so-called golden cars) to in-use testing for compliance and enforcement purposes. Vehicles for in-use tests could be obtained at random from private individuals by enforcement agencies, and tests could be conducted throughout the useful life of vehicles to monitor the durability of emission control systems.
2. Revert the conformity factors to the initial technical consensus proposal made by the EC to Member States in the TCMV meeting of October 2015: a NO<sub>x</sub> conformity factor of 1.6 in 2017 and 1.2 for the final conformity factor in 2019.
3. Accelerate the technical work to include cold-start emissions in the RDE test results evaluation method, with the intention of setting specific, legally binding limits by 2019. Controlling cold-start emissions is especially relevant for air quality in urban environments.

4. Monitor and expand the boundaries of the RDE test procedure. Previous experience has repeatedly shown that driving situations that are not covered by regulations can lead to uncontrolled — yet technically legal — emission behaviors. This is especially true for NO<sub>x</sub> emissions, which grow exponentially outside of the operating conditions covered by the design of the aftertreatment systems and their control algorithms. To prevent this from happening, the European Commission could perform additional, independent tests to monitor the performance of vehicles outside of the boundary conditions of RDE (e.g., ambient temperature, altitude, dynamic driving indicators) and expand the limits as necessary to maintain low in-use emissions.
5. Improve public access to information and provide incentives to foster clean technologies. In addition to including the result of the RDE test in the certificate of conformity and other relevant documents, vehicles that meet the Euro 6 limits during the on-road test could, for example, be granted a “certified clean” label to incentivize both manufacturers and consumers, and help local authorities build their own incentive programs. The results of the on-road tests would be made easily accessible to the public, so that consumers can make informed buying decisions and manufacturers can track their progress and benchmark their vehicles against the competition.

## FINAL REMARKS

The TCMV’s weakening of the RDE conformity factors from the original consensus appears to be a step away from a robust emission regulation. Furthermore, because the RDE test itself does not include in-use vehicles and does not cover all driving situations that give rise to high NO<sub>x</sub> emissions (cold engine starts, dynamic driving, and particle filter regeneration events), actual on-road emissions will be substantially higher than those formally permitted by the proposed conformity factors.

Unless technology neutrality (i.e., equal stringency of emission standards regardless of the engine type) is achieved, regional and local authorities could be compelled to devise disincentive programs — including bans — for diesel cars. By trying to protect the diesel

car industry in the short run, Member States may in fact be compromising its long term viability.

Even though the proposed conformity factors are above the levels that current technology can reasonably achieve, we also acknowledge that the included provisions for their annual revision are a useful instrument to bring them down and reflect the

state of emissions control technology. In spite of its current shortcomings — which should be addressed in future amendments — the RDE regulation is a commendable effort by the European Commission that makes the EU a pioneering region in the use of on-road tests for emissions type-approval. ICCT therefore welcomes it as a major step forward to address Europe's air quality problems.

## SOURCES

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