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Joint Position by TÜV Association, DEKRA und ASA Association

Effective Emissions Testing: Delivering Credible Environmental and Health Policy

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Joint Position on the Roadworthiness Package with a Focus on Exhaust Emissions: PN, NOx, CO

The Roadworthiness Package is a key building block for the credibility of European environmental and transport policy. The ambitious requirements of type approval can only achieve their full effect if vehicles remain compliant under real operating conditions throughout their lifetime. Periodic Technical Inspection (PTI) is the central instrument to ensure this. TÜV Association, DEKRA and the ASA Association therefore explicitly welcome the European Commission's approach to enhance the role of emissions testing in PTI and roadside inspections. The rapid development of vehicle technology, particularly in exhaust after-treatment systems, must be adequately reflected in PTI. Testing methods must therefore be continuously adapted and further developed.

From the perspective of the signatory associations, one principle is clear: modern exhaust after-treatment must be verifiable. Without effective monitoring of all vehicles in operation, a growing gap between regulatory ambition and actual environmental impact is inevitable. The Roadworthiness Package provides the opportunity to close this gap – provided that the proposed inspections are implemented consistently, in a targeted manner and in a harmonised way across Europe.

Particle Number (PN): A Key Test for Effective Health Protection

The introduction of tailpipe particle number measurement represents a major step forward and should be anchored in the Roadworthiness Package consistently. Particularly for diesel vehicles, it enables the reliable detection of defective or tampered particulate filter systems and thus makes a direct contribution to protecting human health. Results of PN-measurements in Germany, Belgium and the Netherlands have uncovered that only about one third of the defects detected by tailpipe measurement would also have been identified by the electronic vehicle diagnostic system. Two thirds of defects would have remained undetected if relying solely on On-Board Diagnostics (OBD).

The associations therefore clearly support the mandatory introduction of PN measurement for diesel vehicles from emission standard Euro 5b onwards. This test is proven in practice, technically feasible and

effective in enforcement. For older diesel vehicles below Euro 5b, opacity measurement using established opacimeters should continue to be applied. This ensures an appropriate, proportionate and technologically adequate inspection across the entire vehicle fleet.

PN measurement is also a meaningful and necessary component of future PTI for petrol engines. EU type-approval already sets particle number limits for petrol engines, particularly those with direct injection from Euro 6; under Euro 7, particle regulation will be further expanded and tightened. Modern gasoline vehicles can produce elevated particle emissions that remain undetected without targeted testing. The particles emitted by petrol engines are particularly small, can penetrate deep into the respiratory system and are therefore of significant health concern. At the same time, they are neither visible nor captured by traditional exhaust measurement parameters. Faulty or ageing components of exhaust after-treatment systems may also remain undetected under current CO measurement procedures. Their monitoring is therefore only possible through dedicated PN measurement; only this allows reliable verification of the proper functioning of after-treatment systems. However, successful implementation requires simple and uniform procedures: PN measurement should be based on largely harmonised measurement technology for both petrol and diesel vehicles to limit investment costs, complexity and market barriers.

Furthermore, the associations emphasise the need for EU-wide harmonisation of measurement procedures, particularly regarding the interaction between OBD testing and tailpipe measurement for both diesel and petrol vehicles. The reintroduction of tailpipe measurement in Germany in 2018 and the addition of PN measurement since July 2023 have clearly demonstrated that it is unrealistic to rely solely on On-Board Diagnostics. OBD reliably detects only a limited share of relevant faults; complementary physical tailpipe measurement therefore remains indispensable.

Nitrogen Oxides (NOx): Impact Driven Measurements

The associations explicitly support the introduction of NOx measurements for diesel vehicles as part of PTI. NOx emissions are a significant environmental and public health concern, particularly in modern diesel vehicles. Due to the complex and multi-stage exhaust after-treatment systems, regular and reliable monitoring is required. In the event of failure or inadequate functioning of the after-treatment system, NOx emissions increase sharply – much more than in older, technically simpler engine concepts. Effective NOx testing can help to reliably identify vehicles with insufficient or non-functional after-treatment systems and reduce real-world emission exceedances across the vehicle fleet.

Mandatory NOx measurement is recommended for passenger cars from emission standard Euro 6d and for heavy-duty vehicles from EURO VI onwards, as from these stages the necessary technical conditions for robust in-use assessment are in place. It is equally important that testing procedures are designed realistically and remain open to alternative, equivalent measurement approaches.

The measurement procedure proposed in the draft (Annex 1, No. 8.2.3.3) is generally suitable, however

requires adequate warm-up of the engine and exhaust after-treatment system prior to measurement. Practical and efficient implementation procedures, as well as alternative approaches where necessary, should therefore be considered, taking local conditions into account.

To ensure reliable and reproducible results, test readiness must be clearly and independently identifiable at the vehicle level, for instance via appropriate OBD parameters or operating states of emission-relevant systems such as AdBlue dosing. Test readiness must be verifiable for all vehicles and must be provided by manufacturers in a binding manner.

For petrol engines, however, the associations see no additional benefit from a separate NOx measurement. Compliance with NOx requirements is already reliably ensured through existing test parameters such as CO emissions and lambda values. An additional NOx test would primarily increase technical and financial burdens without measurably improving the environmental and public health effectiveness of PTI.

Carbon Monoxide (CO): Strengthening a Proven Test

The more precise and stricter assessment criteria for CO measurement envisaged in the Roadworthiness Package are explicitly supported. CO measurement is a proven and effective instrument for assessing the exhaust behaviour of petrol engines and a central element of indirect emissions evaluation. However, its effectiveness depends on a clear and uniform definition of measurement accuracy requirements for testing equipment.

Accordingly, equipment class 0 should be made mandatory under Annex III in accordance with Annex XII of Directive 2014/32/EU in order to ensure comparable and reliable measurement results across all Member States.

Making Full Use of the Roadworthiness Package

The Roadworthiness Package offers the opportunity to further develop PTI from a purely functional check into an effective instrument for environmental and human health protection. TÜV Association, DEKRA and the ASA Association therefore clearly support the inclusion of ambitious yet efficient emissions testing within the regulatory framework. The objective must be technical supervision that safeguards European environmental targets under real operating conditions without losing effectiveness through unnecessary or redundant testing.

The associations call on the German Federal Ministry for Transport to actively support this clear and differentiated position in the ongoing trilogue negotiations and to advocate for an ambitious yet practically implementable design of the Roadworthiness Package.

Key Recommendations

1. Broad and mandatory implementation of PN measurement

Tailpipe particle number measurement must be firmly established as a central instrument of emissions monitoring in PTI for both diesel (from Euro 5b) and petrol vehicles (from Euro 6). Only this enables reliable detection of defective or tampered after-treatment systems and effective control of harmful ultrafine particle emissions.

2. Targeted and practical implementation of NOx measurement for modern diesel vehicles

NOx testing should be applied where it delivers the greatest environmental and health benefits, particularly in modern diesel vehicles (from Euro 6/VI) with complex after-treatment systems. This requires realistic, practical testing procedures and binding manufacturer-provided test readiness.

3. Strengthening and harmonising proven CO measurement

CO measurement remains a proven and effective instrument for assessing the exhaust performance of petrol engines and should be further strengthened. Harmonised requirements for measurement accuracy and testing equipment across Europe are essential to ensure comparable and reliable results.

4. Systematically expanding PTI as a tool for real-world emissions control across the vehicle fleet in Europe

Periodic Technical Inspection in the European Union must ensure that emission requirements are not only met at type approval but remain compliant under real operating conditions throughout the vehicle lifecycle. This requires ambitious, harmonised and practical testing procedures that reliably safeguard the real environmental and public health impact of regulation.

Your contact

Robin Zalwert
Head of Sustainable Mobility
Email: robin.zalwert@tuev-verband.de
Tel. +49 151 12039699
www.tuev-verband.de

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Published by
TÜV-Verband e. V.
Friedrichstraße 136
10117 Berlin

Tel.: +49 30 760095-400
Fax: +49 30 760095-401
Email: berlin@tuev-verband.de
www.tuev-verband.de/en