

16.04.2024



Verband der  
Automobilindustrie

# EURO 7-Sekundärrechtsakte - Bremsstaub

BMDV Fachgespräch





Die GTR-24-Messmethode ist weitgehend fertig –  
wichtige Amendments und Implementierungspunkte sind noch offen

- Themen für 2nd amendment GTR 24

No	Name	Issue
1	Vehicle selection for c-factor testing	To clarify which vehicle shall be selected from the interpolation family To clarify the selection of “worst case” To clarify the selection criteria “highest test mass”*
2	Reporting	Summary of results as “test report” in GTR-24, or full set of testing files?
3	Testing of FCVs	Fuel Cell vehicles are not included in GTR-24, especially in table for fixed c-factors. Own categories for FCV needed? Amendment to GTR-24, or Euro clarification is needed
4	Brake particle filter testing	Further proposals need to be defined for integration into the 2nd amendment GTR-24 in the coming months (eg. handling of the extracted volume, predictive functional strategies, documentation of power consumption, ...)
5	EMB Procedure	To write a procedure for testing the friction share of EMBs To demonstrate that this friction share method works
6	Findings of PMP ILS 3	PMP puts effort in an inter-laboratory-study. It must be ensured that the findings will be part of GTR 24

\*GTR24, I A 4: „...the formal scope of this UN GTR is limited to Light-Duty vehicles up to 3500 kg.

This limitation does not, however, indicate that the scope of this UN GTR should not be applied to a larger group of vehicle categories when implemented into regional legislation. Indeed, Contracting Parties are encouraged to do so if this is feasible and appropriate from a technical, economical, and administrative point of view.

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- Themen für Euro 7-Implementierung

No	Name	Issue
1a	Vehicle selection for c-factor testing	<ul style="list-style-type: none"> <li>- To clarify which vehicle shall be selected from the interpolation family</li> <li>- To clarify the selection of “worst case”</li> <li>- To clarify the selection criteria “highest test mass”*</li> </ul>
1b	Family building for (individual) c-factor	<ul style="list-style-type: none"> <li>- GTR-24 describes which vehicle type shall be tested</li> <li>- Definition of family criteria for allocation of c-factor based on technical parameters</li> </ul>
1c	Extension rules	<ul style="list-style-type: none"> <li>- Next to a family building concept extension rules for c-factor should be considered.</li> </ul>
2	Calculation of vehicle level emissions and general approval concept	<ul style="list-style-type: none"> <li>- GTR-24 describes how the brake particle emissions per brake is measured</li> <li>- Missing procedure, how to determine brake emission at vehicle level</li> <li>- Clarify if an EU7 approval is necessary for a brake system incl. a c-factor on a vehicle level</li> </ul>
3	ANNEX 5, Table 9 (TA and COP)	<ul style="list-style-type: none"> <li>- Clarify “Brake System emission test in WLTP brake cycle”</li> <li>- Description of CoP test, incl. statistics, procedure, pass/fail criteria, number of brake family heads to be tested</li> </ul>
4	ANNEX 5, Table 10 (ISC)	<ul style="list-style-type: none"> <li>- Clarify ISC procedure verifying friction share c-factor</li> <li>- Description of ISC requirement, incl. statistics, procedure, pass/fail criteria, number of vehicles to be tested</li> </ul>

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- Themen für Euro 7-Implementierung

No	Name	Issue
5	Requirements for driving modes regarding c-factor	<ul style="list-style-type: none"><li>- To clarify if all driving modes must be considered for verification of c-factor i.e. independent from a specific program that is used for testing.</li><li>- To clarify which driving modes for very special limited purpose are exempted from this requirement e.g. off-road modes / race modes etc.</li></ul>
6	Handling of malfunctions regarding recuperation during vehicle operation	<ul style="list-style-type: none"><li>- To clarify how to handle a situation with a malfunction regarding recuperation when the vehicle is operated on the road.</li></ul>

- Auch wenn der 12 Monats-Zeitraum für den Bremsenabrieb nicht gilt, ist die zeitnahe Verfügbarkeit des EU implementing acts aufgrund möglicher technischer und kapazitiver Auswirkungen von hoher Bedeutung.

Die Erarbeitung einer Messmethode in der TF 5 steht noch am Anfang

## **To Do–Liste (grob)**

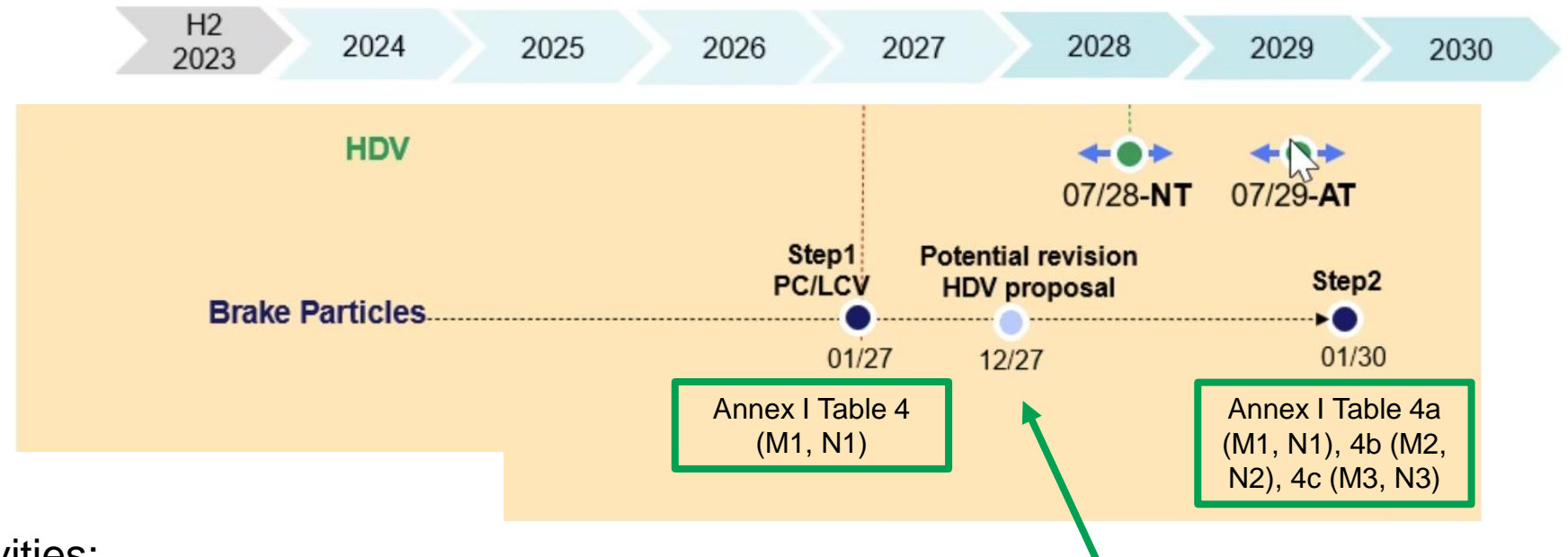
1. Particle measurement: Robust and applicable test procedure shall be established by considering segment differentiation, same procedure for drum brakes and disc brakes?
2. Measurement procedure for regenerative and endurance braking (engine brake, engine brake + retarders) for different segmentation
3. Trailer brake loading and brake differences must be taken into consideration
4. Endurance brake effect – calculated or tested?
5. Brake family and vehicle level emission calculation methods must be clarified for different axle configurations and segments

## **Möglicher Ansatz:**

1. Analyse VECTO for representative brake energy, brake power and temperatures
2. Compare real world wear rates (from validated models) with simulated wear rates from selected VECTO cycle simulations to assess the representativeness of the approach
3. Run selected VECTO cycle(s) in brake particle emission test?
4. Emission result (full friction) needs to be factored with endurance brake / regenerative braking

# Fokus HDV

Erste Grenzwertstufe muss auf Äquivalenzbasis definiert werden



## Issues:

TF5 activity and Brussels activities:

- Must include validation steps of the new HDV brake test method(s) including all non-friction contributions (tractor units and trailers)
- Must include validation of measurability of new limits
- The report foreseen for end-2027 is much too late considering the clear link between Euro 7 HDV powertrain sign-off and HDV braking technologies

6. *By 31 December 2027, the Commission shall submit to the European Parliament and to the Council a report on brake particle emissions reviewing measuring methods and state-of-the-art, in view of the delegated acts referred to in Article 15(2)(a) on the level of the second stage emission limits set out in Tables 4a, 4b and 4c of Annex I.*