OICA contribution to PMP
22 Nov 2023

Content

- Statement on Brake Particle filter testing

- Correlation of Method B and Method D (CAN)

- OICA input to ILS-3

- Aftermarket and Original replacement parts – definitions

Statement on Brake Particle filter testing

Statement to Brake Particle filters

ECE/TRANS/WP.29/GRPE/2024/4

9.2.3. Emissions Measurement Section

[(g) In case of active brake filtering devices, the testing facility may activate the active filtering function (up to a maximum of) 1 sec before the brake event start time as defined in 13.1. In such a case, the active filtering function shall be deactivated at the brake event end time as defined in 13.1.]

- OICA proposes to include more details in the GTR-24 (see following page)

- Consideration of active filter systems is possible if technical proof of functionality including the prediction performance is provided and the requirements of the GTR are met

- Eventually, this should be handled in the 2nd Amendment

Details needed for testing of Brake Particle filters

1. Definition of filter systems

2. Handling of filter systems in general (active/passive):
   1. How to install filter systems at the dynamometer bench.
   2. Handling of the filtered volume flow (e.g. release point).
   3. Filter conditions (new, unused filters?)
   4. When to apply the filter systems (already during bedding?)
   5. How to validate filter systems whose effectiveness depends on wheel airflow (dynamometer bench does not include wheel)?

3. Evaluation of simplified proposal to test active filters at dyno level (GTR-24: ["pump starts 1 second before each WLTP brake event"])
   1. Evaluation of efficiency bias compared to actual performance of filters in the field.
   2. Clarification of the impact on cooling air flow control stability
   3. Impact on tolerances of the temperature requirements
   4. How to incorporate/access a "dynamometer mode" of the filtering systems to allow testing for OEMS and third parties (different behavior at dynamometer compared to vehicle implementation).
   5. How to deal with active filter systems that are running permanently (including systems that switch between high-flow and low-flow mode.
   6. Definition of "switching off" the filter - Immediately stop the flow or stop the additional blower, allowing the rotating fan to still transport air?

- Eventually, this should be handled in the 2nd Amendment

Alternative Method / Pressure method

Criterion GTR-24 Working Document

Equivalency Criterion

The alternative method shall be deemed to be equivalent to the reference method if one of the following conditions is fulfilled:
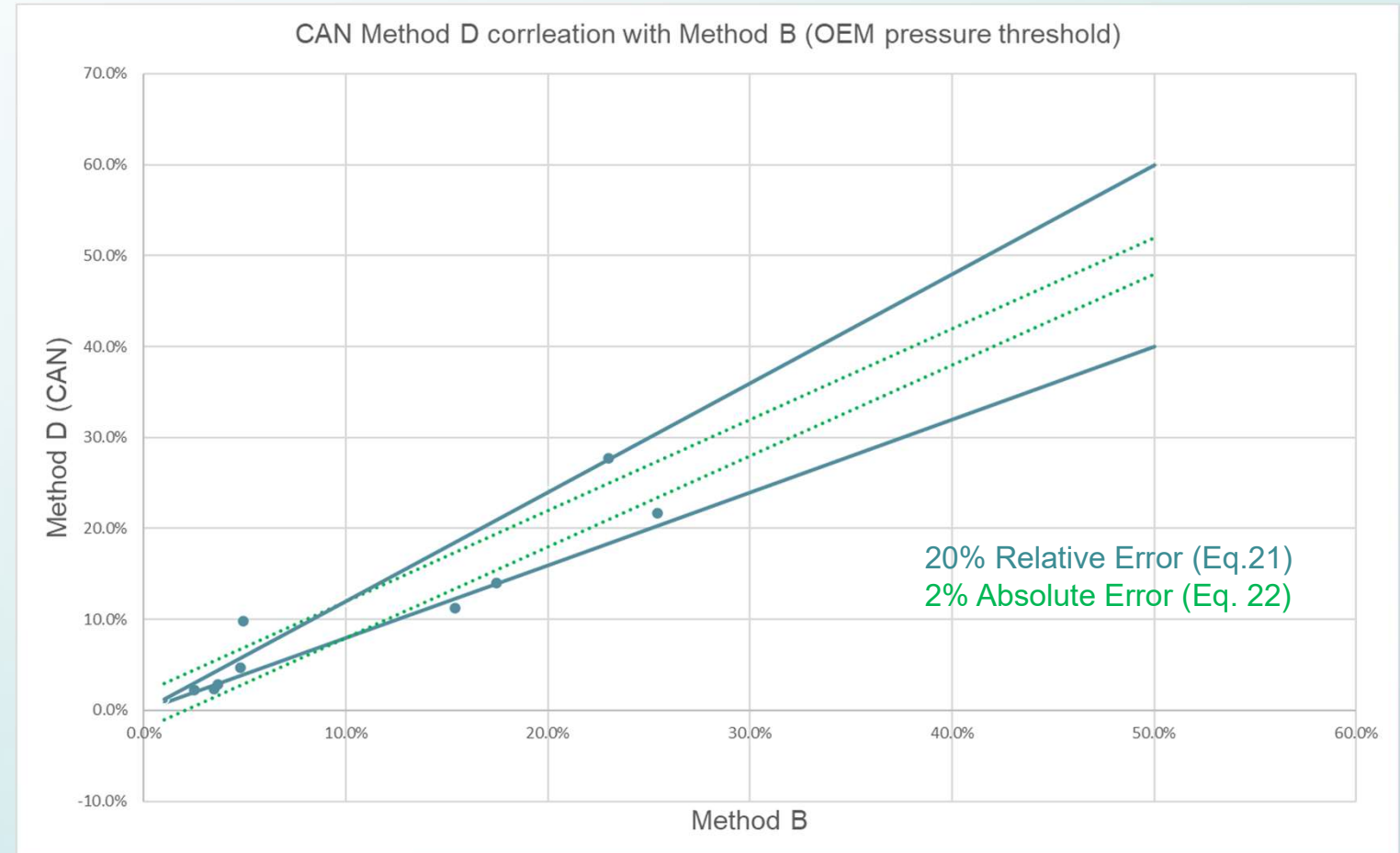
$$\left|\frac{c_{alt} - c}{c}\right| \leq [10 \text{ per cent}] \qquad \text{(Eq. C21)}$$

$$[|c_{alt} - c| \leq [x \text{ per cent}] \qquad \text{(Eq. C22)}]$$

Where:

c_{alt} is the vehicle-specific friction braking share coefficient measured through the alternative method.

Propose slight clarification:

"The alternative method shall be deemed to be equivalent to the reference method if ~~one~~ **any** of the following conditions is fulfilled"

- OICA proposal: 20% relative error, or 2% absolute error

Input to ILS-3

OICA input to ILS-3

Topic 1: Brake selection
- Comparability to the results of the first ILS
- Depiction of low emission brakes and the modern brake market

Topic 2: GTR-conformity
- Define "GTR-Checklist", what is an achievable definition of GTR-conformity?
- More detailed information about the partaking laboratories
- Extraordinary findings could stem from laboratories that slightly deviate from GTR-conformity → Influence of certain criteria could become clearer

Topic 3: Partaking laboratories
- Representative number of laboratories & of tests (per brake) per laboratory (to control reproducibility & repeatability)
- Representation of relevant test rig manufacturers
- Information about the used enclosure design
  - State the used measures to achieve GTR-conformity, do not send an exact copy of the enclosure geometry
  - Special interests: Last bend before the enclosure (in x*d), presence of shoulders in the enclosure, measurements on the identical test bench?
- Data / comparisons regarding Bedding → generating a quantity-based factor, logging of brake parameters and emission factors (PN)
- Logging of all relevant brake system and test rig temperature

Topic 4: Definition of boundaries before started testing
- Decision on the testing of flow homogeneity criterium through simulation or testing? (35% at plane C)
  - for simulation → not just a qualitive answer, velocity fields, Description of the used CFD
  - for testing → not just a qualitive answer, show a specific result of the testing, define acceptable measurement accuracy and common measurement method
  - Define criteria and condition of a suitable measurement environment
- Which statistical methods should be used to compare the measurements/laboratories
- Description of the sampling lines
  - Jets, hoses, bends, diameter, Iso-kinetic

Topic 5: Organization
- Reactivate taskforces and communicate their results
- Definition of timeline

OICA suggests to kick off TF3 asap and will support the efforts.

Aftermarket and Original replacement parts – definitions

Original and non-original replacement parts – Definitions

Proposal

- **Original parts = original replacement parts**
  – parts used in production and identical to production used in service (no additional release)

  => tested according to GTR-24 during homologation

- **Non-original replacement part including**
  – so called "second line", which may be not identical to "original parts"; service parts released and provided by the "service division" of the affected OEM, with a different identification code than the original part
  – aftermarket parts

  => tested according to GTR-24 1st amendment (tables 5.1 and 5.2)