

Meeting Minutes PMP Webconference

29th June 2023, 12:00-14:30 CET

- DRAFT -

0. Introduction & Welcome

Barouch Giechaskiel (BG, JRC, PMP Chairman) and Rainer Vogt (RV, OICA/Ford/Technical Secretary PMP) welcomed about 106 participants.

1. Review of Meeting Minutes last PMP meeting 24.05.2023

RV reviewed the meeting minutes of the last PMP Meeting, 24.05.2023 which are available at the UNECE website. Comments may be sent to RV/BG within the next two weeks.

2. PMP update (ToR, GRPE)

BG reported on the last June GRPE 89th session. The ToR were renewed until June 2025.

Topics include: (i) friction share coefficient of LDV brakes and second interlaboratory study (ii) HDV brakes setup, cycles, load profile, non-friction braking

Tyre/road particle projects are continued to be monitored.

Brakes emission test procedure is now adopted as GTR-24.

Next PMP meetings early September, and October

Hybrid PMP Meeting: 9th January Geneva for half day.

3. Exhaust update

Exhaust emissions: no new topics expected. Continue monitoring of measurements and calibration procedures.

Round Robin with two CPCs is planned for start in Sep 2023. Laboratories should announce their interest participating to BG.

4. TF4 update

On behalf of the OICA team RV presented the TF-4 work and the DRAFT informal document ANNEX-C. It has largely been presented during the last PMP meeting and there was good progress with missing topics introduced.

BG stated that comments can be send to JRC within 1-2 days. BG will send to GRPE as informal document.

No immediate comments were made.

5. Brakes aftermarket family building

BG introduced to the aftermarket concept – see presentation.

Q.: Where will these EU7 related items be discussed? Any additional AGVES meeting?

BG: Implementing rules will be discussed in September 2023

BG clarified that the overall emissions need to be below 7 mg. A brake may be higher, as long as the overall is below.

Jarek Grochowicz (JG, Ford/OICA): Who is responsible for the vehicle emission value?

BG: The replacement part manufacturer is responsible. Needs to be clarified in EU-7 implementation.

Paolo Alburno (PA, CLEPA): The procedure for part surface area calculation can be provided. A description/procedure for a "combination" pad and disc will be given. CLEPA has no data on floating vs fixed caliper brakes but the impact is expected to be small compared to the additional testing burden. Robust procedure for replacement parts (like R103) should apply – i.e. a similar procedure as for exhaust catalysts should be developed.

Theo Grigoratos (TG): Need an analysis for drum brakes – if there is no data each brake will have to be treated individually.

Geoffrey Angus Ross: How is road loss considered?

BG, RV: Road loss will be considered during emission measurement (as GTR-24)

BG clarified Question of Carlos Agudelo (CA, LINK): the entire brake assembly is tested in emission test.

CA: What if disk is not available to aftermarket

BG: Assume that aftermarket has access to OE parts

TG: CLEPA has confirmed that OE parts are available.

CA: How about OES replacement parts? Service parts?

BG: OE parts have to be tested

Mr. Jandl (FEMFM): It is not clear in which regulation aftermarket parts would fall (R90 replacement, R13 OEMs)?

BG: This is topic of AGVES/EU-7 implementing regulation. Treatment of replacement parts will be clarified.

Andrew Stephenson (OICA/JLR): How to test older vehicles?

TG: It will apply only to new vehicles (EU-7).

Heinz Bacher (BMW/OICA) stated that the allowance of +15% allowance means accepting higher emissions for aftermarket pieces. That does not make sense from an environmental point of view. This could add up to higher vehicle emissions?

TG: Usually a combination of worst case would not occur. However, the concern is received.

SG: How about OES parts?

BG: Aftermarket procedure could be used if material is differed.

Marcel Mathissen (MM, OICA/FORD): How are different materials defined? Is this a matter of chemical composition, slight changes?

BG: The classification criteria – besides LS/NAO - needs to be looked at (definitions are in the presentation).

PA (CLEPA- in chat): We do propose that each chemical composition for pads is a different family

JG: How would the disc with highest emission be found? The disc coating could be different?

TG: the grouping of coatings might not be entirely correct – need to accept uncertainty. This might be changed in future updates of GTR.

RV: Is there emission data available, on which the aftermarket concept is based? For example, how large is the spread of emissions within a geometric size class?

PA (CLEPA): Emission data is not available. The original CLEPA proposal had energy based classes.

CA commented in chat: Does pad area include inner + outer? several brakes have different sizes.

6. Brake dust collectors (Tobias Wörz, (TW) Mann & Hummel)

Emission Measurement of brakes with/without brake particle filters are presented. (See presentation).

Active systems need a control of the blower to operate in an energy efficient condition. When system is running in a vehicle on-road the time tpre (time to start vacuum before brake event) can be determined.

Tpre has to be demonstrated before with the vehicle during development value. In the GTR Tpre could be a standard value, or a vehicle specific parameter. The digital signal would trigger the vacuum before the brake event. M+H wants to support an amendment.

Ravi Vedula (Rve, Brakes India): what is the power consumption?

TW: this depends on the specific situation

SG: What about off-brake emissions?

TW: The system can also be turned on for off-brake situations.

Peter Rothacher (Bosch) via chat: How does the active / passive filter system influence smaller particle emission like PM2,5 or PN (CPC)?

TW: we see no shift in the particle size distribution when measuring with or without the filter

Andreas Jandl (FEMFM): What influence do the different filter options have on the general performance of the braking system (performance vs. temperature)?

TW: With an active system you have no influence to the temperature of the brake system therefore you do not influence the performance. With the passive system a temperature increase needs to be considered during the layout of the brake system.

Juergen VON WILD (OICA/BMW) via chat: did you check whether it was possible to fulfill the T-Limit of the GTR with the passive Systems?

TW: for a fully covered brake system I need to double check the measurement data,

Christoph von Weidinger (AVL) via chat: Who is going to organize/lead the ILS2 activities?

BG: usually JRC is organizing - due to confidentiality issues; preparations will start in September.

7. Caltrans project (C. Agudelo, Link)

CA reported on "New Research on Brake Wear Particulate Matter Emissions from Several Heavy Truck Vocations in California" – see presentation.

The project involves CARB, CALTRANS, ERG, EPA LINK, Federal Mogul, ArvinMeritor, Bendix.

Brake temperature for different Heavy vehicles was evaluated and drive cycle created from individual vehicles. Total truck PM10 emissions are reported.

TG and Michael Arndt (AVL): What are the dimensions of the enclosure?

CA: will provide dimensions. The enclosure must be larger. Tunnel can be the same as LD GTR-24

JG: What is the sensitivity impact of the duty cycle?

CA: test was conducted in defined vocation.

RVE: there was impact.

8. Ducting & enclosure for brake emission testing (OICA)

Juan Londono (JL, OICA/VW) presented on the work of the WG OICA (see presentation). The work is mainly based upon CFD simulations, for example as shown in an illustration where particle losses might occur.

Optimization of the enclosure is carried out by Literature, CFD simulation, and DOE to evaluate geometric designs.

OICA proposes to include the setup in ILS-2. A timeline for implementation is introduced.

CA (LINK): this is a good approach. The repeatably of brake emission needs to be determined and "10%" goal should be in brackets.

TG: Repeatability and reproducibility needs to be investigated. Improvements can be discussed after there is a clear picture of the reproducibility with the current specifications.

Sampling line could also cause variability.

JL: No investigation was done for sampling line, yet.

TG: A more targeted ILS-2 which will be defined in TF-3 will start in September and first discussion at next PMP. The aim will be to include less laboratories all of which will need to be 100% GTR compliant.

9. Any other Business

HORIBA: No need for volumetric flow measurement requirements for PN will be presented in September.

Next PMP meeting: Early/Mid September