



Particle Measurement Programme (PMP)

Update on exhaust and non-exhaust vehicle emissions

B. Giechaskiel and T. Grigoratos

Webex 1 Dec 2021

Agenda

1. Introduction and Update on GRPE Nov '21 (10 min)
2. Exhaust emissions (80 min)
3. Non-exhaust emissions (30 min)

Agenda 1a/3

Update on 84th GRPE Nov '21 (10 min)

a) UNR 154 (WLTP)

- All GTR 15 changes transferred to UNR 154 (except 10 nm methodology)
 - Catalytic stripper can be used for 23 nm systems
 - Improvements of particle number counter, e.g.
 - $\pm 5\%$ accuracy instead of $\pm 10\%$,
 - k factor included in the efficiencies
 - no maximum internal (coincidence) correction

Agenda 1b/3

b) GRBP (Groupe Rapporteur Bruit et Pneumatiques – Working Party on Noise and Tyres). One of the priorities:

Tyre Abrasion Test method development

- A common task force between GRBP and GRPE will address the issue of tyre abrasion and particles from tyre/road wear (2nd phase, beyond 2023).

Agenda 2/3

Exhaust emissions

- a) Tailpipe sampling
- b) Calibration procedures
- c) PN-PEMS (postponed for next meeting)
- d) Total particles (postponed for next meeting)

Tailpipe sampling

Proposal for a new Consolidated Resolution concerning Exhaust Ultra-Fine Particle Number Measurement For Heavy Duty Engines

Working document: *ECE/TRANS/WP.29/GRPE/2021/17 - (IWG on PMP)*

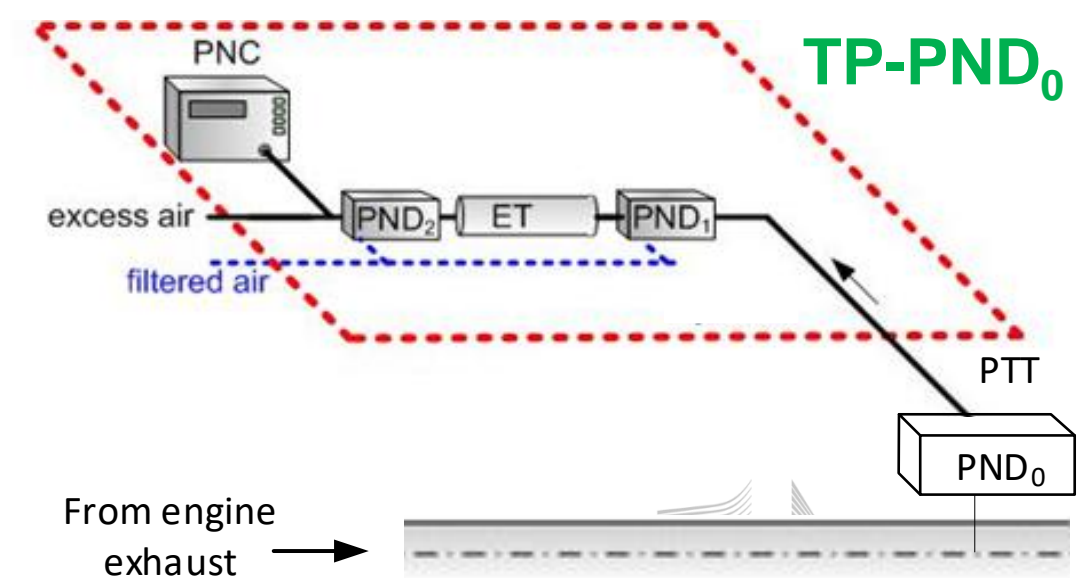
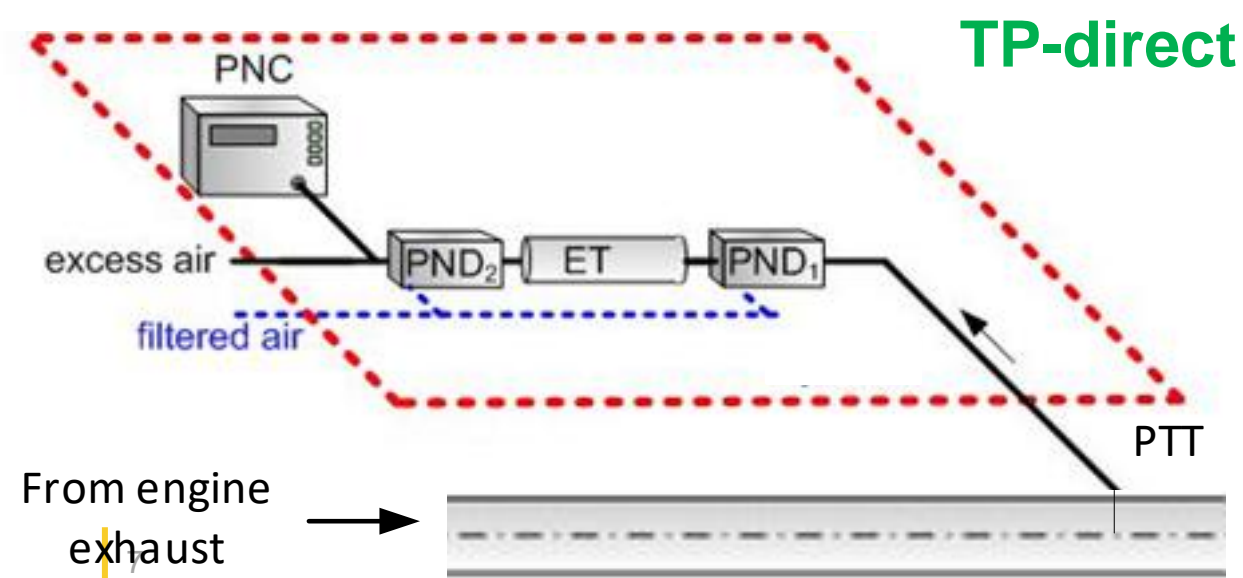
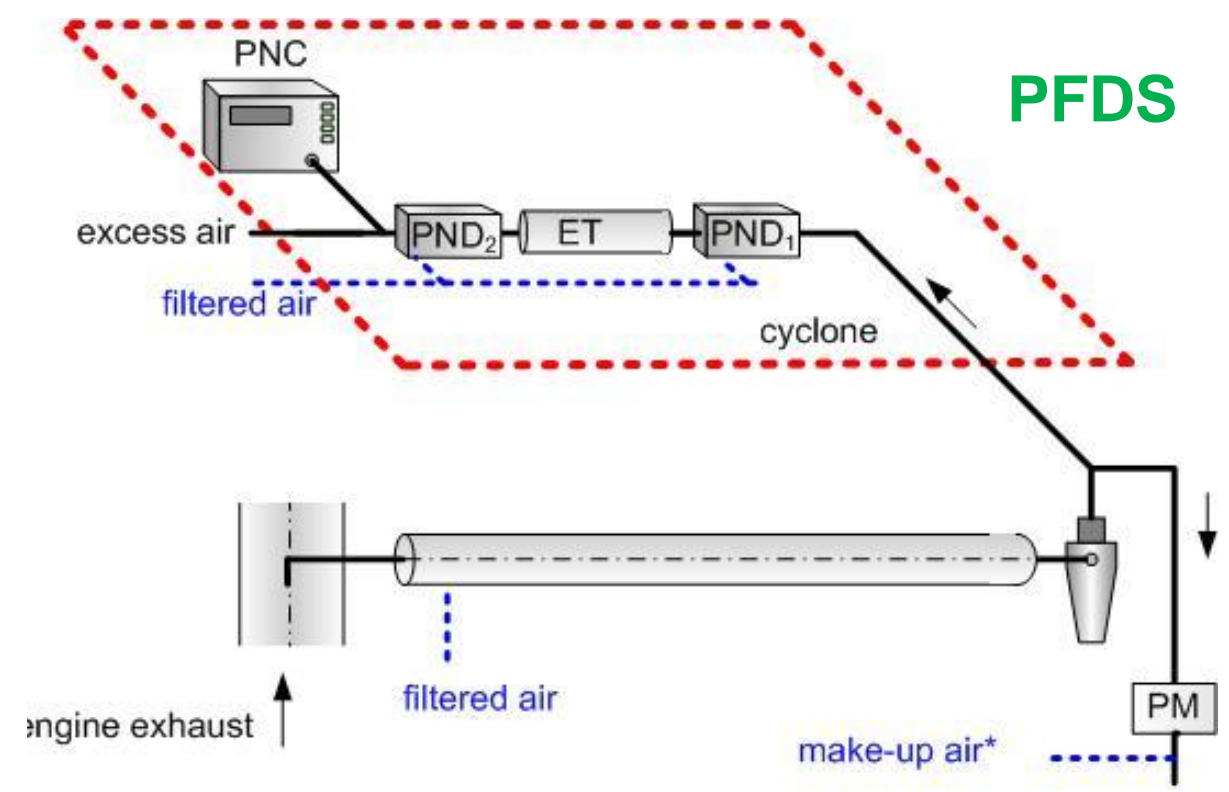
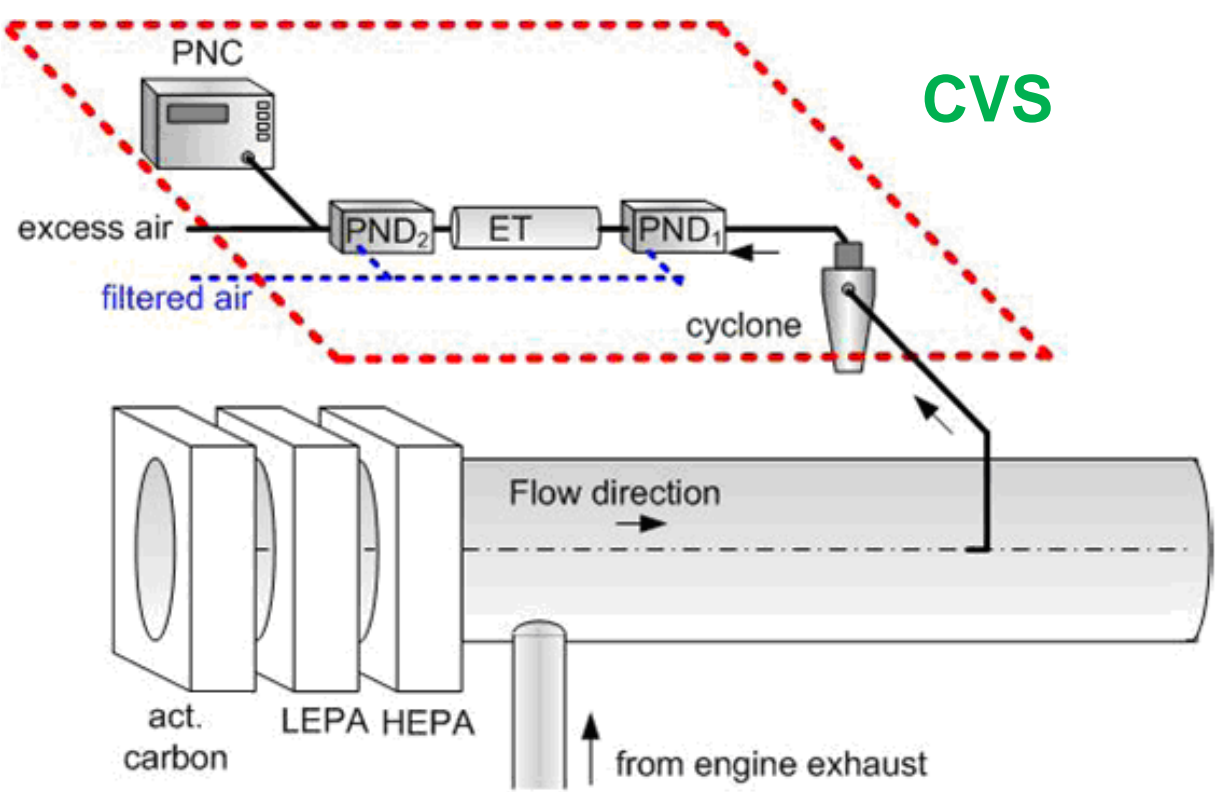
Postponed for GRPE Jan 2022.

Sub-23 nm protocol: Closed

Open issue: Pre-diluter permitted losses

Tests were conducted in summer 2021

A report for the tailpipe proposal will be needed ([JRC is working on it](#))



Tailpipe sampling

Presentations on the topic

Tailpipe sampling with fixed dilution (HD)

Pre-diluter	A cold or hot pre-diluter may be located at the end of the particle sampling probe and in front of the PTT. A fixed dilution ratio >5:1 shall be applied to the cold or hot dilution stage. Cold dilution is defined as a dilution with (unheated) dilution air and/or diluter temperature $\geq 20^{\circ}\text{C}$.
Losses	The penetration for each model of pre-diluter shall be determined as described in A.8.2.2.4 The final system penetration (pre-diluter, PTT and VPR) shall not decrease 10% the requirements of A.8.1.3.3.6. The particle concentration reduction factors of each pre-diluter shall be determined as described in A.8.2.2.2. The complete system (pre-diluter, PTT and VPR) shall not exceed 0% for 50 nm, 10% for 30 nm, and 25% for 15 nm (if applicable) the requirements of A.8.1.3.3.4.
Sampling line	When sampling directly from the tailpipe the residence time until the pre-diluter or the VPR shall be ≤ 1 seconds . The tubing shall be heated at $\geq 150^{\circ}\text{C}$ if ≥ 10 cm, otherwise only insulated. Any unheated parts shall be < 10 cm and insulated . Best engineering...

Calibration procedures

Presentations on the topic

Calibration procedures

Document: *20210430_JRC_questions_02*

<https://wiki.unece.org/display/trans/PMP+Web+Conference+15.07.2021>

Questions were sent end of March 2021

Number of replies: 12

OEMs and associations: 1+1+1+1+1+1+1 (=58%)

Instrument manufacturers: 1+1+1+1 (=33%)

Institutes: 1

Agenda 3/3

Non-exhaust emissions

- a) Timeline for GTR *
- b) Update on the ILS activities (TF3)
- c) Update on TF4 activities
- d) ACEA/OICA views on brake wear emissions

Any other business

* Adopted at WP29 185th session (23-25 Nov 2021)