

Testing of AES¹ on in-service vehicles

Test Equipment Specifications

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VELA 2

- **Emission test cell for passenger cars (4WD) and light/medium commercial vehicles**
- The climatic test cell has an air circulation system that provides enough number of cell air changes (≥ 15) in order to allow the testing of vehicles fuelled with diesel, gasoline, CH₂, LH₂, LPG, LNG and CNG. The cell is equipped with dedicated sensors for gaseous fuels.



- **Chassis dyno:**
 - Diameter: 48" (two roller benches)
 - Inertia range: 454-4500 kg
 - Maximum speed: 200 km/h
 - Manufacturer: Maha GmbH
- **Fan:**
 - Variable speed (following the vehicle speed)
 - Maximum speed: 200 km/h
 - Flow: 7200 m³/h
 - Pm: 55kw
 - rpm: 1500 min⁻¹
 - Δ pt: 1600Pa
 - Manufacturer: Deutsche BABC CK BSH – Turbo Lufttechnik GMBH

¹ AuxiliaryEmissions Strategies

- **Test cell temperature range:**
- From -10° C to 35 ° C

- **Sampling system:**
- Conventional CVS Horiba system with a critical flow Venturi
- Flow rate range: from 3.0 m³/min to 30 m³/min.
- Separated tunnel for gasoline vehicles (no PM mass measurement)
- Dilution air: controlled in temperature 22°C and humidity 50% ±5

- **Analysers:**
- CO: Horiba IR analyser.
- NOx: Horiba chemiluminescence analyser.
- HC: Horiba FID analyser.
- CH₄: Horiba FID analyser.
- Particulate mass: particulate samples are collected according to the legislative procedure using Teflon coated glass fiber filters and the mass is determined by weighing.
- On-line measurement of gaseous pollutants on raw exhaust (modal analysis post cat and pre cat, bag gasoline, diesel, ulev)

B. Portable Emissions Measurement Systems (PEMS)

These are very "generic" PEMS equipment descriptions, applicable to the commercial available systems owned by the JRC, i.e. the Sensors Semtech-DS and Ecostar and the AVL Move:

- **Analysers:**
- CO: NDIR analyser.
- NOx: NDUV analyser.
- HC: HFID analyser (for heavy-duty vehicles only).
- CH₄: HFID analyser (for CNG heavy-duty vehicles only).

- **Other :**
- Direct exhaust flow measurements (EFM using Pitot tubes)
- Global Positioning System (GPS).