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HDH Meeting

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Introduction

- European Commission supports the development of the HDH procedure and would like to see an adoption of the procedure according to the timetable
- The intention is to introduce the HDH procedure as part of the Euro VI package for type approval of HD Hybrid vehicles (in UNECE R 49 or in EU legislation)
- The HDH procedure, however, introduces a number of issues that needs to be resolved not only in the HDH procedure it self but also in relation to the implementation into the European type approval legislation (Euro VI), in UNECE Reg 49 and probably also in other CPs' legislation.
- These issues cannot be resolved only on the GTR level but need to be addressed in the context of the applicable European legislation (i.e. EU Reg 595/2009 or UN R49)

Legal basis for Euro VI (EC) No 595/2009 - UN R49

- HDH introduces a new procedure in GTR no 4 for hybrid drivetrains
- The procedure builds on the WHVC and transforms the vehicle cycle into a specific test-cycle for the combustion engine
- The WHVC is not defined in GTR No 4 (only WHTC/WHSC)
- (EC) Reg No 595/2009 makes a clear link between limit values and the test cycle (WHTC and WHSC)

Question

- What legal procedure is needed to introduce the HDH procedure based on WHVC into European legislation?
- This needs to be discussed in the EU context and cannot be solved in the GTR context.

Legal basis Regulation (EC) No 595/2009 (Euro VI)

Euro VI Emission Limits

	Limit values							
	CO (mg/kWh)	THC (mg/kWh)	NMHC (mg/kWh)	CH ₄ (mg/kWh)	NO _x ⁽¹⁾ (mg/kWh)	NH ₃ (ppm)	PM mass (mg/kWh)	PM ⁽²⁾ number (#/kWh)
WHSC (CI)	1 500	130			400	10	10	8,0 × 10 ¹¹
WHTC (CI)	4 000	160			460	10	10	6,0 × 10 ¹¹
WHTC (PI)	4 000		160	500	460	10	10	⁽³⁾

PI = Positive Ignition.

CI = Compression Ignition.

⁽¹⁾ The admissible level of NO₂ component in the NO_x limit value may be defined at a later stage.

⁽²⁾ A new measurement procedure shall be introduced before 31 December 2012.

⁽³⁾ A particle number limit shall be introduced before 31 December 2012.'



Legal basis Regulation (EC) No 595/2009 (Euro VI)

Article 2 (scope)

This Regulation shall apply to motor vehicles of categories...

Article 3 (Definitions)

1. 'engine' means the motive propulsion source of a vehicle for which type-approval as a separate technical unit, as defined in point 25 of Article 3 of Directive 2007/46/EC, may be granted;

Article 3 point 25 of Dir 2007/46/EC:

25. 'separate technical unit' means a device subject to the requirements of a regulatory act and intended to be part of a vehicle, which may be type-approved separately, but only in relation to one or more specified types of vehicle where the regulatory act makes express provisions for so doing;

Can an 'engine' as defined by Article 3 in 595/2009 cover a 'hybrid powerpack'?

How should the emission results from HDH be handled?

- In the HDH procedure only the work from the ICE can be measured during emission testing on the engine test bench
- If the total work for the complete hybrid power train should be included, this has to come from the HILS simulation (not measured)
- Japanese procedure uses total work at $0 = \Delta \text{SOC}$.
- Engine is defined in EU legislation as well as in R49 but power train or similar is not
- Decision on system/engine affects other procedures like PEMS for Euro VI

How to handle software models in the legal context

- The HDH procedure will include a library of software models
- How should these models be handled in the legal context
- Who could be responsible for keeping the "reference" models etc.
- ...?

The HDH procedure will be part of a "package"

- Euro VI has introduced a number of new requirements and tests that makes the Euro VI legislation much more robust than i.e. Euro V
- It is a must that also HD hybrids will have the same good emission performance as we now see that the early conventional Euro VI vehicles have.
- In Europe the PEMS requirements and possibly other parts of the Euro VI legislation need to be amended in order to cope with hybrid vehicles
- Emission limits is not part of the scope of neither the current GTR 4 nor the mandate of the HDH group
- In order to facilitate a smooth implementation into the regional legislation in Europe and elsewhere, it is suggested to give certain flexibility to CPs on how to introduce the procedure and limit values into the regional legislation

Conclusions

- The legal situation for introducing HDH-procedure into the Euro VI legislation needs further investigation
- The implementation into European Euro VI legislation needs amendments also on other parts such as PEMS procedure
- For the implementation phase more discussions on the EU level will be needed and this might be the case for other CPs as well
- EC proposes to introduce some words in the HDH procedure that gives flexibility to CPs on how to use the results from the HDH procedure in the regional legislation (similar as how CO₂ gives flexibility to CPs on how to use the HDH procedure)
- Give the responsibility to CPs to administer the model library (similar to how EPA the current software for the GHG-rule)
- Create some kind of reference for CPs for the model library on the UNECE level