

Dear Mike, dear all.

As I am facing again some problem to insert my comments, I am submitting them to all of you via mail:

Comment on Paragraph 6.9.2. □ Rewording + striking out of the sentence “if (...) necessary”

a) ICE power (in kW):

ICE power is based on the measured engine speed, intake manifold pressure in inlet system and fuel flow rate ~~if the confirmation of air fuel ratio according to ISO 1585 is necessary.~~ It shall be determined by **comparison of data with** a relevant engine dynamometer test **results according to ISO 1585.**

If the intake manifold pressure or fuel flow rate deviates significantly from **relevant ISO 1585 measurement results**, conduct **a separate** ISO 1585 measurement under the conditions using the above-measured engine speed and intake manifold pressure in inlet system or fuel flow rate, ask the vehicle manufacturer or conduct TP2. **The engine dynamometer test fuel shall be the same as in 6.3.**

Justification:

- Rewording to make text clearer
- Striking out of “if...necessary” because:
 - o only comparing engine speed and manifold pressure with R85 measurements gives you no indication about the influence of the atmospheric pressure
 - o Example: TP1 performed at 3000 meters above sea, R85 measurement at sea level
Due to the thinner air, the power of combustion engine at 3000 meters lower than at sea level
If hybrid system is compensation that less ICE power with a higher E-Power, TP1 would end up in a higher power value than the system has
 - o Solution: always measure fuel flow rate in addition to engine speed and intake manifold pressure □ then you know if the ICE power you assume in TP1 is really the power you have
 - o Measuring the fuel flow rate should be possible without big efforts

<JAMA Comment>

1. ISO でこの条文を追加した理由は、ISO1585 でエンジン性能を計測した A/F と、実車にて HEV 最大出力の測定時の A/F が異なる場合、そのまま 1585 の結果を流用できない可能性を考慮して、追加した。

但し、最大出力の定義上、本来同一であるべきと考えたため、必要に応じての文言を追記した。

I will explain The reason why ISO added “if...necessary” .

If the air fuel ratio of ISO 20762 that is HEV maximum power measurement differ from the A/F of ISO 1585 that is the engine performance test procedure, you cannot apply the results of ISO 1585.

There might be some possibility.

We believed that the condition of maximum engine output should have same A/F ratio.

After discussion within ISO technical members, We added “if...necessary”

2. 現在の EM 規制下で A/F を異なる運転をすることはできない。すなわち吸気管圧力のみでよい。

過渡的に異なる場合は出力との相関は薄い(出力に貢献しない)

高地で測定する場合、OEM は TA と協議する(そんな高度で測定することがナンセンス)

Under current emission control regulations, Even high altitude condition, you cannot change the

A/F ratio to maintain emission controllability. As a result, measurement of Intake manifold pressure is enough. Transient difference of A/F does not contribute the maximum output.

If the measurement of HEV output is needed at high altitude such as 2000m or higher, OEM will consult to TA.

3.したがって、流量について常に必要なわけではない。必要と判断するなら高地の評価時に限定でも良い)

Therefore the measurement of flow rate is not always necessary. If needed, only high altitude evaluation might be limited.

4.その場合は、CAN 情報での代替でも良い

As that situation, CAN information will be alternative.

5. 高地でエンジン性能の低下を補う電池の使い方は限定的。平地に比べ電池をより使う側となり、電池の劣化に影響するため、高地でのエンジンの性能低下に応じた電池の使い方が望ましい。

The compensation to less ICE power with a higher E-Power needs extra battery power compared to normal or sea level condition.

Since this will affect the battery deterioration, Battery usage will be preferable to correlate with ICE power at high altitude.

Additional comment:

As we run into the validation of the methodologies, one should be aware that in TP1, the combustion engine power is going 100% into the calculation (with respect to serial and power split hybrids).

For serial as well as power split hybrids, the losses in the generator as well as the electric motor are not being considered.

Following range extender as an example for a serial hybrid:

- Hybrid with an E-motor having 125KW and an ICE motor having 25kW
- K as conversion factor from electrical power to mechanical power set to 0.85 as described in FDIS for TP1
- Transmission efficiency: e.g. 0.98

□ TP1 power value: 131.9 kW

□ TP2 power value: 125 kW

The stronger your ICE is, the higher the deviation will be.

< JAMA comment >

Since the definition of TP1 and TP2 are different, the result will be different for series and power split hybrid.

IF the conventional ICE vehicle will be considered to apply the TP2 method, MT, AT and CVT will have different the transmission efficiency. As a result , different maximum ICE power might occur.

Currently the maximum ICE power has been defined as a one value.

JAMA believed that TP1 is to comparable method to the current conventional ICE vehicle.

JAMA understand the Matthias's comment,

But please tell us how to deal with GTR draft wording.

JAMA appreciate your productive discussion or proposal.

1. 定義が異なっているので、なるべきしてなった結果。

2. コンベの場合に TP2 の採用を考えると、Transmission efficiency は、MT,AT,CVT 等で異なると推定
現在は、エンジン性能のみで一儀的に決定しているが、コンベについても TP2 の考え方を適応するの
か。コンベとまったく異なる考え方を HV で採用されるべきではないと考える。

3 今回の提案は、コンベと同じものさしで比較、あるいは、WLTP への反映を考えており、大きく考え方を
変えるべきではない

コメントは、理解したが、GTR への記述をどのようにしたいのか？

より建設的な議論、提案を期待している。

Hope you all can follow my explanations...we might discuss these points also in the EVE proper.

Thanks and best regards.

See most of you next week.

Matthias