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World Forum for Harmonization of Vehicle Regulations

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Item 5 of the provisional agenda

UN Regulations Nos. 24 (Visible pollutants, measurement of power of C.I. engines (Diesel smoke)), 85 (Measurement of the net power), 115 (LPG and CNG retrofit systems), 133 (Recyclability of motor vehicles) and 143 (Heavy Duty Dual-Fuel Engine Retrofit Systems (HDDF-ERS))**Proposal for a new Supplement to the original version of UN Regulation No. 85 (Measurement of the net power)****Submitted by the expert from the International Organization of Motor Vehicle Manufacturers***

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA). This document proposes to amend the wording of the description of auxiliaries to be fitted for testing in order to reduce potential testing burden.

* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

Annex 5, Table 1, Footnote 1b, amend to read:

"^{1b} **In the following cases, the complete exhaust system shall be fitted as provided for the intended application:**

Where there is a risk of an appreciable effect on the engine power;

In the case of two-stroke ~~and positive ignition~~ engines;

When the manufacturer requests that this should be done.

In other cases, an equivalent system may be installed provided the pressure measured at the exit of the engine exhaust system does not ~~differ~~ **exceed** by more than 1,000 kPa ~~from~~ that specified by the manufacturer.

The exit from the engine exhaust system is defined as a point 150 mm downstream from the termination of the part of the exhaust system mounted on the engine."

Annex 5, Table 1., Footnote 9, amend to read:

"⁹ Charge air cooled engines shall be tested with charge air cooling, whether liquid or air cooled, but if the engine manufacturer prefers, a test bench system may replace the air cooled cooler. In either case, the measurement of power at each speed shall be made with the same pressure drop and temperature drop of the engine air across the charge air cooler on the test bench system as those specified by the manufacturer for the system on the complete vehicle, **or the charge air cooler outlet temperature shall be adjusted for the ambient temperature recorded during the vehicle tests by increasing or decreasing the charge air cooler outlet temperature by the same amount that the ambient conditions for the vehicle test varied from the standard temperature.**"

II. Justification

1. Table 1 describes the auxiliaries to be fitted for the test to determine net power of engine.
2. The existing wording may be interpreted to mean that the exhaust system for a positive ignition engine cannot be modified in any way. This can cause problems when installing the engine and exhaust in the test cell and prevents coverage of small differences with a single approval test (family concept).
3. The final 2 sentences of the footnote provide sufficient assurance that the exhaust system used is representative (as with compression ignition engines)
4. However, the restriction in positive or negative deviations of exhaust pressure is also over restrictive in the determination of maximum power and should be amended to restrict only a positive pressure deviation
5. The current test method for measuring charge-air-cooled engines net power is not suitable for high power engines of those. While waiting for the constant test condition (ref. Annex 5, 3.5.), the charge air cooler outlet temperature rises and the net power cannot be measured correctly.
6. To solve this problem, we propose an alternative test method to "decrease the charge air cooler outlet temperature by the same amount that the ambient conditions for the vehicle test varied from the standard temperature." This is aligned with SAE J1349, "9.3 Application of Vehicle Transient Data to Net Power Test."

7. The unit of pressure in the footnote has been changed from Pa to kPa to avoid confusion between thousand separators and decimal separators.
