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Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****198th session**

Geneva, 10-13 March 2026

Item 4.9.5. of the provisional agenda

1958 Agreement:**Consideration of draft amendments to existing
UN Regulations submitted by GRPE****Proposal for the 01 series of amendments to UN Regulation
No. 177 (DEVP)****Submitted by the Working Party on Pollution and Energy***

The text reproduced below was adopted by the Working Party on Pollution and Energy (GRPE) at its ninety-third session (ECE/TRANS/WP.29/GRPE/93, para. 32). It is based on ECE/TRANS/WP.29/GRPE/2025/21, GRPE-93-28, GRPE-93-50 as amended by Annex V of the session report. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their March 2026 sessions.

* In accordance with the programme of work of the Inland Transport Committee for 2026 as outlined in proposed programme budget for 2026 (A/80/6 (Sect. 20), table 20.7), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



Paragraph 3.5.11., add to read:

"3.5.11. "Major maintenance" means the adjustment, repair or replacement of a component or module that could affect the accuracy of a measurement. "

Paragraph 3.6.3., add to read:

"3.6.3. "Testing Facility" means the testing laboratory including all of the hardware and software components needed to perform a measurement according to this regulation. "

Paragraph 7.1.5., add to read:

"7.1.5. Thermal control
In case of system bench, the manufacturer shall provide the proper thermal control (e.g. airflow velocity) to maintain system operating temperatures and system functions equivalent to those as expected on a whole vehicle under reference conditions."

Paragraph 7.2.1., amend to Measurement items and required accuracy in Table 2:

"Table 2

Measurement items and required accuracy

<i>Item</i>	<i>Units</i>	<i>Accuracy</i>	<i>Remarks</i>
Chassis dynamometer speed	km/h	The dynamometer speeds shall be controlled with an accuracy of ± 0.2 km/h or $\pm 0.1\%$ of full scale vehicle speed, whichever is greater.	
Chassis dynamometer force	N	The accuracy of the force transducer shall be at least ± 10 N for all measured increments. This shall be verified upon initial installation, after major maintenance and within 370 days before testing.	
Axle/wheel rotational speed	rev/s	± 0.05 s ⁻¹ or ± 1 % of full scale rotational speed, whichever is greater.	
Axle/wheel torque	Nm	± 6 Nm or ± 0.5 % of full scale torque, whichever is greater.	

"

Paragraph 8.1., amend to read:

"8.1. General
The following test procedures determine a vehicle system power rating for a hybrid electric vehicle, or for a pure electric vehicle with more than one propulsion energy converter.
Two test procedures are described herein.
Test procedure 1 (TP1) is based on measured electrical power, estimated ICE power, and estimated electrical conversion efficiency.
Test procedure 2 (TP2) is based on measured torque and speed at the drive shaft(s) or wheel hub(s) and estimated mechanical conversion efficiency.
TP1 and TP2 are intended to be technically equivalent methods for determining a vehicle system power rating from available measurements. TP1 and TP2 are

distinguished by the specific instrumentation, measurements, other inputs, and calculations necessary to determine the vehicle system power rating.

Each powered axle that provides propulsion under the maximum power condition shall be tested by chassis dynamometer or hub dynamometer or, on request of the manufacturer and with the approval of the Type Approval Authority, on a system bench.

Vehicles that are powered by two powered axles under the maximum power condition shall be tested on a four-wheel-drive chassis dynamometer, or each powered axle shall be tested simultaneously by hub dynamometer or, on request of the manufacturer and with the approval of the Type Approval Authority, on a system bench.

In the case a system bench is used in place of a dynamometer the measurement facilities must be approved by the Type-Approval Authority according to Annex 6.

In the case of vehicles whose maximum power, in the judgment of the Type-Approval Authority, exceeds that of readily available dynamometers, it is permissible to use a system bench, which may include simulators, in place of a dynamometer without following the provision of Annex 6.

The manufacturer shall be responsible for the accuracy of determined system power values. Options, methods including test facilities and tolerances given in this regulation shall not be used to under- or overestimate the indicated system power of the vehicle as described in paragraph 8.10. "

Paragraph 8.1.2.2., amend to read:

"8.1.2.2. Measurements specific to TP2

For TP2, the following measurements are additionally required: torque and rotational speed at the powered axle shafts or wheel hubs.

Important: if the ICE power needs to be corrected according to the provisions of paragraph 8.9.3.2., the measurement requirements of TP1 with regard to current and voltage may also apply (see paragraph 8.9.3.3.).

Wheel torque and rotational speed measurement may be provided either by means of a hub dynamometer or by means of system bench or by means of appropriate, calibrated measurement device(s) for torque and rotational speed of the powered axle shaft(s) or wheel hub(s) or drive shaft(s).

If a powered axle delivers power to the wheels through a differential, it is sufficient to instrument and collect data from only one of the two drive shafts or wheel hubs. In this case, the measured torque at a drive shaft or wheel hub shall be multiplied by 2 in order to get the total torque per powered axle. "

Paragraph 8.8.3., amend to read:

"8.8.3. Vehicle conditioning / System Bench conditioning

The measurement devices shall start collecting data.

The object of conditioning is to operate the vehicle / system until the normal operating temperature ranges specified by the manufacturer (paragraph 8.1.1.4.) for the temperature-related operational metrics (paragraph 8.8.1.) have been reached and have stabilised.

Prior to the test, perform initial conditioning by placing the vehicle / system in the power-rating mode, if applicable (see paragraph 8.8.5.), and run at the speed of 60 km/h at the vehicle road load for at least 20 minutes, or as recommended by the vehicle manufacturer. The vehicle manufacturer or the Type-Approval Authority may specify a different time period, speed, driver-selectable mode, dynamometer mode, or cycle, as necessary to achieve stable operating metrics.

At the end of initial conditioning, the operational metrics (see paragraph 8.8.1.) shall be recorded.

During the test, monitor the operating metrics and perform additional conditioning as necessary to maintain the operating metrics within the normal operating temperature ranges. "

Paragraph 8.11., amend to read:

"8.11. Internal validation of vehicle system power rating

The vehicle system power rating according to TP1 or TP2 shall fulfil the following requirement:

The implied downstream efficiency between the reference point(s) and the road shall not be greater than 1. Implied downstream efficiency is computed by dividing the average power recorded at the dynamometer rollers (or hub dynamometer or system bench if applicable) between the 8th and 10th second by the sustained vehicle system power result (prior to any correction under paragraph 8.9.3.3.)."

Paragraphs 9.1. to 9.3., amend to read:

"9.1. Vehicle type with regard to system power

9.1.1. Only vehicles that are the same with respect to all of the following elements may be part of the same vehicle type:

- (a) Powertrain system configuration, including number, type, and mechanical arrangement of power sources and operating strategy;
- (b) ICE power rating.
- (c) Net power of all electric machines in the powertrain;
- (d) Construction type (for example, asynchronous, synchronous, or other specific construction type) of all electric machines in the powertrain, and type of electric energy converter(s) between the electric machine(s) and the battery;
- (e) Type of battery cell, including format, capacity, voltage, and chemistry;
- (f) Type of battery pack, including battery configuration (number of cells in series and mode of connection);
- (g) Nominal voltage of the battery;
- (h) Maximum current of the battery; and
- (i) Type of vehicle (PEV, OVC-HEV, or NOVC-HEV).

At the request of the manufacturer, with the approval of the Type-Approval Authority and with appropriate technical justification, the manufacturer may deviate from the above criteria.

If vehicles differ in (b) and (c) solely due to different software, they may be considered part of the same type.

9.2. Families

Within a vehicle type, vehicles may be grouped into vehicle families as described below:

9.2.1. If, within a vehicle type, multiple indicated figures for peak and sustained system power exist, they shall all be based on tests conducted according to the specified procedures in this regulation and shall be traceable to a family.

9.2.2. At the request of the manufacturer and with the agreement of the type approval authority or technical service, a family may be duplicated into various distinct families without the need to conduct additional tests (e.g. to distinguish between different K-factors derived according to paragraph 8.1.1.2.).

9.3. Identification of families for type-approval

To differentiate between different families within the same vehicle type, the manufacturer may specify a unique identifier of the following format:

SP-nnnnnnnnnnnnnnn -WMI

nnnnnnnnnnnnnnnn is a string with a maximum of fifteen characters, restricted to using the characters 0-9, A-Z and the underscore character '_'.

WMI (world manufacturer identifier) is a code that identifies the manufacturer in a unique manner defined in ISO 3780:2009.

It is the responsibility of the owner of the WMI to ensure that the combination of the string nnnnnnnnnnnnnnn and the WMI is unique to the family."

Annex 1, Appendix 2, Test Report 2.1., amend to read:

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2.1.	Chassis dynamometer/Hub dynamometer/ System bench ²⁾
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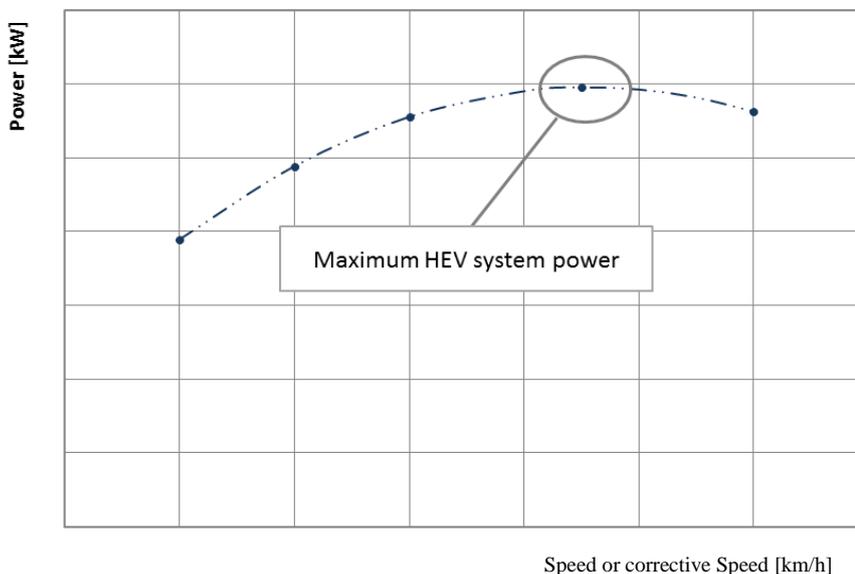
Annex 5, paragraph 5., amend to read:

"5. The power delivered to the dynamometer at each operating point may be determined by reference to dynamometer power data, or dynamometer speed, force and torque data, where available. "

Annex 5, Figure 29, amend to graph:

"Figure 29

Relation between power and speed



"

Annex 6, add to read:

"Annex 6

Approval of the system bench testing facility by the Type-Approval Authority

A system bench shall represent all components of a real vehicle which would be necessary to perform TP1 or TP2 on a chassis dynamometer or hub dynamometer and are necessary to power the wheels including propulsion energy storage system(s), propulsion energy converter(s), peripheral devices, all ECUs, original ECU data and for hybrid electric vehicles the aftertreatment system.

During the test, the auxiliaries necessary for the drive train operation in the intended application as listed in Table 1 of this Annex for PEV and Table 1 and 2 of this Annex for NOVC-HEV/OVC-HEV shall be installed.

The results of the system bench testing shall be compared to those obtained using the chassis or the hub dynamometer to demonstrate the testing facility's qualification.

1. Test procedure
 - 1.1. Two vehicles covering the maximum and minimum outputs of the vehicles planned to be measured within the testing facility shall be selected, and their respective system power values shall be evaluated by testing with a chassis or hub dynamometer in accordance with the provision laid out in this regulation and by using the system bench facility concerned.
2. Approval criteria
 - 2.1. The testing facility shall be approved if both of the following two criteria are fulfilled:
 - (a) The difference between the sustained system power / peak system power measured on the chassis dynamometer or hub dynamometer and the sustained system power / peak system power measured on the system bench testing facility in accordance with Chapter 8. of this regulation for each of the tested vehicle shall be 0.05 or less:

$$\Delta_k = \frac{P_{k,SB}}{P_{k,DM}} - 1$$

where

Δ_k is the difference in system power for vehicle k between the system bench and the chassis dynamometer or hub dynamometer, in percent

$p_{k,SB}$ is the system power value obtained at the system bench testing, in kilowatts

$p_{k,DM}$ is the system power value obtained at the dynamotor testing in kilowatts.

- (b) The arithmetic average \bar{x} of the two differences of the two vehicles shall be within 0.02.

$$\bar{x} = \frac{|\Delta_1| + |\Delta_2|}{2}$$

- 2.2. The approval of the testing facility shall be recorded by the responsible authority along with all the measurement data and a description of the approved testing facility (e.g. exact place of the facility, room description, testing hardware and software, calibration data).
 - 2.2.1. The approval of the testing facility is limited to the tested vehicle's architecture.

- 2.3. The testing facility may be used for system power determination for five years following the granting of approval, or until major maintenance.

Table 1

Auxiliaries to be fitted for the test to determine system power on system bench for PEV
 ("Standard-production equipment" means equipment provided by the manufacturer for a particular application).

No.	Auxiliaries	Fitted for system power test
1	Speed variator and control device	Yes: Standard-production equipment or test bench equipment (e.g. restbus simulation)
2	Liquid-cooling Radiator or radiators* ¹ Fan Fan cowl Pump Thermostat ³	Yes: Standard production equipment *(if more than one cooling circuit is installed in the vehicle)
3	Electric equipment	Yes: Standard production equipment or test bench equipment
4	Test Bench thermal control (e.g, auxiliary fan)	Yes, if necessary

¹ The radiator, the fan, the fan cowl, the water pump and the thermostat shall be located on the test bench in the same relative position as on the vehicle. The cooling-liquid circulation shall be activated by the drive train water pump only.

Cooling of the liquid may be produced either by the drive train radiator, or by an external circuit, provided that the pressure loss of this circuit and the pressure at the pump inlet remain substantially the same as those of the drive train cooling system. The radiator shutter, if any, shall be in the open position.

Where the fan, radiator and fan cowl cannot conveniently be fitted for the bench test, the power absorbed by the fan when separately mounted in its correct position in relation to the radiator and cowl (if used), shall be determined at the speed corresponding to the motor speeds used for measurement of the motor power either by calculation from standard characteristics or by practical tests. This power, corrected to the standard atmospheric conditions should be deducted from the correct power.

Table 2

Auxiliaries to be fitted for the test to determine system power on system bench for NOVC-HEV/OVC-HEV

("Standard production equipment" means equipment provided by the manufacturer for a particular application)

No.	Auxiliaries	Fitted for system power test
1	Intake system Intake manifold Crankcase emission control system Air filter Intake silencer Speed limiting device	Yes, standard production equipment Yes, standard production equipment ^{1a}
2	Induction heating device of intake manifold	Yes, standard production equipment. If possible, to be set in the most favourable position.
3	Exhaust system Exhaust purifier Exhaust manifold Supercharging device Connecting pipes ^{1b} Silencer ^{1b} Tail pipe ^{1b} Exhaust brake	Yes, standard production equipment
4	Fuel injection equipment (petrol and diesel) Prefilter Filter Pump High pressure pipe Injector Air intake valve ² , if fitted Electronic control system air, flow meter, etc... if fitted Governor/control system. Automatic full-load stop for the control rack depending on atmospheric conditions	Yes, standard production equipment
5	Liquid cooling equipment Radiator Fan ⁴ Fan cowl Water pump	Yes, standard production equipment
6	Electrical equipment	Yes, standard production equipment
7	Supercharging equipment (if fitted) Compressor driven either directly by the engine, and/or by the exhaust gases Charge air cooler ⁴ Coolant pump or fan (engine driven) Coolant flow control devices (if fitted)	Yes, standard production equipment
8	Test Bench thermal control (e.g, auxiliary fan)	Yes, if necessary
9	Anti-pollution devices ⁵	Yes, standard production equipment

^{1a} The complete intake 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 used and a check should be made to ascertain that the intake pressure does not differ by more than 100 Pa from the limit specified by the manufacturer for a clean air filter.

^{1b} 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 by more than 1,000 Pa 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.

² The air intake valve is the control valve for the pneumatic governor of the injection pump. The governor of the fuel injection equipment may contain other devices which may affect the amount of injected fuel.

³ The radiator, the fan, the fan cowl, the water pump and the thermostat shall be located on the test bench in the same relative positions as on the vehicle. The cooling liquid circulation shall be operated by the engine water pump only.

Cooling of the liquid may be produced either by the engine radiator or by an external circuit, provided that the pressure loss of this circuit and the pressure at the pump inlet remain substantially the same as those of the engine cooling system. The radiator shutter, if incorporated, shall be in the open position.

Where the fan, radiator and cowl system cannot conveniently be fitted to the engine, the power absorbed by the fan when separately mounted in its correct position in relation to the radiator and cowl (if used), must be determined at the speeds corresponding to the engine speeds used for measurement of the engine power either by calculation from standard characteristics or by practical tests. This power, corrected to the standard atmospheric conditions (293.2 K (20 °C) and 101.3 kPa), should be deducted from the corrected power.

⁴ 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.

⁵ They may include, for example, EGR* system, catalytic convertor, thermal reactor, secondary air supply system and fuel evaporation protecting system.

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* Exhaust gas recirculation.