

### **Proposal for amendments to Regulation No. 101**

#### **A. Proposal:**

*Annex 9, paragraphs 4.2.2.1 to 4.2.2.5., amend to read:*

- "4.2.2.1. To determine the electric range of a hybrid electric vehicle
- 4.2.2.1.1. The applicable test sequence and accompanying gear shift prescription, as defined in paragraph 1.4. of Annex 8, is applied on a chassis dynamometer adjusted as described in Appendices 2, 3, and 4 of Annex 4 of Regulation No. 83, until the end of the test criteria is reached.
- 4.2.2.1.2. To measure the electric range the end of the test criteria is reached when the vehicle is not able to meet the target curve up to 50 km/h, or when an indication from the standard on-board instrumentation is given to the driver to stop the vehicle or when the battery has reached its minimum state of charge. Then the vehicle shall be slowed down to 5 km/h by releasing the accelerator pedal, without touching the brake pedal and then stopped by braking.
- 4.2.2.1.3. At a speed over 50 km/h, when the vehicle does not reach the required acceleration or speed of the test cycle, the accelerator pedal shall remain fully depressed until the reference curve has been reached again.

**However, if the fuel consuming engine starts during this procedure, the speed and/or acceleration of the vehicle is to be reduced without touching the brake pedal until the fuel consuming engine stops running. The vehicle speed at this point is to be maintained until the test cycle can be followed again. This procedure is to be followed until the end of the test as defined in paragraph 4.2.2.1.2.**

**At the request of the manufacturer and with the agreement of the technical service, the fuel consuming engine may be disabled for the determination of the electrical range.**

- 4.2.2.1.4. To respect human needs, up to three interruptions are permitted between test sequences, of no more than 15 minutes in total.
- 4.2.2.1.5. At the end, the measure  $D_e$  of the distance covered using the electrical motor only in km is the electric range of the hybrid electric vehicle. It shall be rounded to the nearest whole number. Where the vehicle operates both in electric and hybrid modes during the test, the periods of electric only operation will be determined by measuring current to the injectors or ignition. "

#### **B. Justification:**

If the usage of a fuel consuming engine is allowed for the procedure to determine the electric range of a hybrid electric vehicle, manufacturer might take advantage by using recuperation energy that has been provided by the fuel consuming engine. The vehicle could be accelerated to a speed that the electrical engine only could not have reached. The recuperation energy increases the SOC and the electric range can be extended. Therefore, the influence of the fuel consuming engine should be restricted by stopping the acceleration immediately and return to electric mode only. If this is not possible due to the application of the vehicle, the speed level has to remain unchanged till the curve is reached again and the periods of using the fuel consuming engine have to be excluded.