

## **Technical report on the development of Amendment 3 to global technical regulation No. 15 on Worldwide harmonized Light vehicles Test Procedures (WLTP)**

### **I. Mandate**

1. Amendment 3 to global technical regulation (GTR) No. 15 was developed by the Informal Working Group (IWG) on Worldwide harmonized Light vehicles Test Procedures (WLTP) in the framework of Phase 2 of the development of GTR No. 15. The Executive Committee (AC.3) of the 1998 Agreement adopted the authorization to develop Phase 2 of GTR No. 15 at its June 2016 session (ECE/TRANS/WP.29/AC.3/44).

### **II. Objectives**

2. To clarify phase, cycle and vehicle class terminology. This enabled permitting interpolation between different levels of downscaling, cycle classes and speed caps, all of which had been agreed as technically justifiable. All figures in the GTR showing WLTC cycle phases and the corresponding time/speed tables were modified accordingly.

3. To introduce improvements to the gear shifting procedures. This was achieved by including changes to gear selection and shift point determination for vehicles equipped with manual transmissions. In detail, this involved calculating gearshift points within an interpolation family, defining the  $v_{max}$  to be used for classification and gear use determination, clarification of the use of  $v_{max}$  using the downscaled cycle as a base cycle, calculating the minimum engine speed to drive, clarifying the conditions the gear in which maximum speed is reached, and providing an additional safety margin for the full load power curve.

4. To define the possible and permissible combinations of test vehicle selection and family requirements. This was done by introducing a table and eliminating the repetition of text.

5. To define the calculation of the average test mass during road load determination.

6. To define single and double roller dynamometers.

7. To correct minor spelling mistakes and/or punctuation, and restructuring some paragraphs. To bring writing and formatting consistency to the GTR.

### **III. Meetings held by Task Forces**

8. The proposed changes in Amendment 3 to GTR No. 15 listed in section II above were discussed at length and agreed upon by all participants during the following Task Force face-to-face or audio/web meetings:

- (a) Drafting Sub-group on March 2, 2017;
- (b) The seventeenth IWG meeting in January 2017 in Geneva;
- (c) Gearshift Task Force meetings held on September 26 and on December 16 in 2016.