

Family concept comments 2020-01-28

EC proposal presented 2020-01-10	Comments from OICA
<p>1. TYPE 6 FAMILY BUILDING A Type 6 family shall comprise finished vehicles with similar emission characteristics. Vehicle emission types may be included in a Type 6 family only as long as the completed vehicles within a Type 6 family are identical with respect to the characteristics in point 1.1.</p>	<p>Vehicle emission types not mentioned elsewhere in GTR 15. Is the intention to replace 'vehicle emission types' with e.g. interpolation families?</p>
<p>1.1 Technical criteria</p>	
<p>1.1.1. Propulsion type (e.g. ICE, NOVC-HEV, OVC-HEV)</p>	
<p>1.1.2. Type(s) of fuel(s) (e.g. petrol, diesel, LPG, NG, ...). Bi- or flex-fuelled vehicles may be grouped with other vehicles, with which they have one of the fuels in common.</p>	
<p>1.1.3. Combustion process (e.g. two stroke, four stroke)</p>	
<p>1.1.4. Number of cylinders</p>	
<p>1.1.5. Configuration of the cylinder block (e.g. in-line, V, radial, horizontally opposed)</p>	
<p>1.1.6. Engine volume The vehicle manufacturer shall specify a value V_{eng_max} (= maximum engine volume of all vehicles within the Type 6 family). The engine volumes of vehicles in the Type 6 family shall not deviate more than – 22 % from V_{eng_max} if $V_{eng_max} \geq 1\,500$ ccm and – 32 % from V_{eng_max} if $V_{eng_max} < 1\,500$ ccm</p>	<p>5.6.1.2 of GTR 15 uses the term 'engine displacement'.</p>
<p>1.1.7. Method of engine fuelling (e.g. indirect or direct or combined injection)</p>	
<p>1.1.8. Type of cooling system (e.g. air, water, oil)</p>	
<p>1.1.9. Method of aspiration such as naturally aspirated, pressure charged, type of pressure charger (e.g. externally driven, single or multiple turbo, variable geometries ...)</p>	
<p>1.1.10. Types and sequence of exhaust after-treatment components (e.g. three- way catalyst, oxidation catalyst, lean NOx trap, SCR, lean NOx catalyst, particulate trap)</p>	
<p>1.1.11. Exhaust gas recirculation (with or without, internal/external, cooled/non- cooled, low/high pressure)</p>	

<p>1.2. Extension of a Type 6 family An existing Type 6 family may be extended by adding new vehicle emission types to it. The extended Type 6 family and its validation must also fulfil the requirements of points 1 and 2. This may in particular require the Type 6 testing of additional vehicles to validate the extended Type 6 family according to point 2.</p>	<p>If 'extension' is a type approval reference, use wording 'adding vehicles' instead? 'Validate' is not used for Type 1 test in GTR 15.</p>
<p>1.3. Alternative Type 6 family As an alternative to the provisions of point 1.1 the vehicle manufacturer may define a Type 6 family, which is identical to a single vehicle emission type.</p>	<p>Is there anything in the previous parts prohibiting this? With the purpose of clarification either here or in section 1 above, add text stating that vehicles from one vehicle emission type/interpolation family, or several vehicle emission types/interpolation families, may be included in a Type 6 family?</p>
<p>2. Selection of vehicles for Type 6 testing when validating a Type 6 family By selecting vehicles from a Type 6 family it should be ensured that the following technical characteristics relevant for pollutant emissions are covered by a Type 6 test. One vehicle selected for testing can be representative for different technical characteristics. For the validation of a Type 6 family vehicles shall be selected for Type 6 testing as follows:</p>	
<p>2.1. For each combination of fuels (e.g. petrol-LPG, petrol-NG, petrol only, ethanol-petrol, diesel-biodiesel), on which some vehicle of the Type 6 family can operate, at least one vehicle that can operate on this combination of fuels shall be selected for Type 6 testing.</p>	
<p>2.2. The manufacturer shall specify a value PMR H (= highest power-to-mass- ratio of all vehicles in the Type 6 family) and a value PMR L (= lowest power-to-mass-ratio of all vehicles in the Type 6 family). Here the 'power-to-mass-ratio' corresponds to the ratio of the maximum net power of the internal combustion engine as: Rated engine power: kW at min –1 (manufacturer's declared value) and of the reference mass, where "reference mass" means the mass of the vehicle in running order less the uniform mass of the driver of 75 kg and increased by a uniform mass of 100 kg. At least one vehicle configuration representative for the specified PMR H and one vehicle configuration</p>	<p>It is important that any definition does not require adding additional vehicles/test objects. It must be possible to use vehicles used for Type 1 testing. Could 'power-to-mass-ratio' be replaced with e.g. 'power-to-cycle energy ratio' since cycle energy is used generally in this GTR.</p>

<p>representative for the specified PMR L of a Type 6 family shall be selected for testing. If the power-to-mass ratio of a vehicle deviates by not more than 5 % from the specified value for PMR H, or PMR L, the vehicle should be considered as representative for this value.</p>																	
<p>2.3. At least one vehicle for each transmission type (e.g., manual, automatic, DCT) installed in vehicles of the Type 6 family shall be selected for testing.</p>																	
<p>2.4. At least one four-wheel drive vehicle (4x4 vehicle) shall be selected for testing if such vehicles are part of the Type 6 family.</p>																	
<p>2.5. For each engine volume occurring on a vehicle in the Type 6 family at least one representative vehicle shall be tested.</p>																	
<p>2.6. At least one vehicle for each number of installed exhaust after-treatment components shall be selected for testing.</p>	<p>As far as we understand, this section was introduced with the WLTP 1st act (2017/1151) but deleted with the WLTP 2nd act (2018/1832).</p> <p>We suggest this section 2.6 is deleted. All aspects of this should be covered by 1.1.10 above.</p>																
<p>2.7. Notwithstanding the provisions in points 2.1 to 2.6, at least the following number of vehicle emission types of a given Type 6 family shall be selected for testing:</p>	<p>Replace 'vehicle emission types' with interpolation families?</p>																
<table border="1"> <thead> <tr> <th data-bbox="203 1123 500 1266">Number N of vehicle emission types in a Type 6 family</th> <th data-bbox="500 1123 808 1266">Minimum number NT of vehicle emission types selected for Type 6 testing</th> </tr> </thead> <tbody> <tr> <td data-bbox="203 1266 500 1304">1</td> <td data-bbox="500 1266 808 1304">1</td> </tr> <tr> <td data-bbox="203 1304 500 1341">from 2 to 4</td> <td data-bbox="500 1304 808 1341">2</td> </tr> <tr> <td data-bbox="203 1341 500 1379">from 5 to 7</td> <td data-bbox="500 1341 808 1379">3</td> </tr> <tr> <td data-bbox="203 1379 500 1417">from 8 to 10</td> <td data-bbox="500 1379 808 1417">4</td> </tr> <tr> <td data-bbox="203 1417 500 1455">from 11 to 49</td> <td data-bbox="500 1417 808 1455">$NT = 3 + 0,1 \times N (1)$</td> </tr> <tr> <td data-bbox="203 1455 500 1493">more than 49</td> <td data-bbox="500 1455 808 1493">$NT = 0,15 \times N (1)$</td> </tr> <tr> <td colspan="2" data-bbox="203 1493 808 1564">(1) NT shall be rounded to the next higher integer number.</td> </tr> </tbody> </table>	Number N of vehicle emission types in a Type 6 family	Minimum number NT of vehicle emission types selected for Type 6 testing	1	1	from 2 to 4	2	from 5 to 7	3	from 8 to 10	4	from 11 to 49	$NT = 3 + 0,1 \times N (1)$	more than 49	$NT = 0,15 \times N (1)$	(1) NT shall be rounded to the next higher integer number.		<p>Replace 'vehicle emission types' with interpolation families?</p>
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