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REVIEW OF TOLERANCES, ACCURACIES AND PRECISIONS IN ANNEX 4

WLTP-12-26E

**BMW
GROUP**



Rolls-Royce
Motor Cars Limited

WLTP ANNEX 4

REVIEW OF COASTDOWN TOLERANCES

Minutes of IWG #11, Geneva:

- OICA remarked the lacking alignment of specified tolerances in Annex 4 and will develop an amendment for review in the RLD TF and SG Drafting.

Initial proposal July 2015

- Many issues immediately agreed upon
- Several issues discussed and agreed in f2f-meeting
- Two open point remain (splitting of coastdown runs and temperature range)

WLTP ANNEX 4

REVIEW OF COASTDOWN TOLERANCE. OPEN ISSUES.

Paragraph	Old	New
4.3.1.3.4.	Although it is recommended that each coastdown run be performed without interruption, split runs are permitted if data cannot be collected in a continuous way for all the reference speed points. For split runs, care shall be taken so that vehicle conditions remain as stable as possible at each split point.	Although it is recommended that each coastdown run be performed without interruption, split runs are permitted if data cannot be collected in single run for all the reference speed points. For split runs there must not be more than 3 parts and care shall be taken so that vehicle conditions remain as stable as possible at each split point.
4.1.1.2.	Atmospheric temperature The atmospheric temperature should be within the range of 278 up to and including 313 K.	The atmospheric temperature should be within the range of 278 up to and including 303 K . If the temperature difference between start and end of the coastdown tests is more than 5°C, the correction has to be done separately for each run.

Green Text: Agreed even if proposal in red is not agreed.

WLTP ANNEX 4

REVIEW OF COASTDOWN TOLERANCES. AGREED CHANGES.

Paragraph	Old	New
3.1. (a)	Vehicle speed: ± 0.5 km/h or ± 1 per cent, whichever is greater;	Vehicle speed: ± 0.2 km/h with a measurement frequency of 10Hz
(c)	Wheel torque (per torque meter): ± 3 Nm or ± 0.5 per cent of the maximum measured torque, whichever is greater;	wheel torque: ± 6 Nm or ± 0.5 per cent of the maximum measured total torque, whichever is greater, for the whole vehicle with a measurement frequency of a minimum of 10Hz
(d)	Wind speed: ± 0.3 m/s;	Wind speed: ± 0.3 m/s with a measurement frequency of a minimum of 1Hz
(e)	Wind direction: $\pm 3^\circ$;	Wind direction: $\pm 3^\circ$ with a measurement frequency of a minimum of 1Hz
(f)	Atmospheric temperature: ± 1 K;	Atmospheric temperature: ± 1 K with a measurement frequency of a minimum of 0,1Hz
(g)	Atmospheric pressure: ± 0.3 kPa;	Atmospheric pressure: ± 0.3 kPa with a measurement frequency of a minimum of 0,1Hz
(h)	Vehicle mass: ± 10 kg; (± 20 kg for vehicles $> 4,000$ kg)	Vehicle mass: ± 10 kg; (± 20 kg for vehicles $> 4,000$ kg); the same scale has to be used before and after the test
(k)	Chassis dynamometer roller speed: ± 0.5 km/h or ± 1 per cent, whichever is greater	delete point (k) completely -> dyno is defined with tighter tolerances in Annex 5
(l)	Chassis dynamometer force: ± 10 N or ± 0.1 per cent of full scale, whichever is greater.	delete point (l) completely -> dyno is defined with tighter tolerances in Annex 5

WLTP ANNEX 4

REVIEW OF COASTDOWN TOLERANCES. AGREED CHANGES.

Paragraph	Old	New
4.1.1.1.1.	Permissible wind conditions when using stationary anemometry	
	Stationary anemometry shall be used only when wind speeds average less than 5 m/s and peak wind speeds are less than 8 m/s. In addition, the vector component of the wind speed across the test road shall be less than 2 m/s. Any wind correction shall be calculated as given in 4.5.3. Wind correction may be waived when the lowest average wind speed is 3 m/s or less.	Stationary anemometry shall be used only when wind speeds over a period of 5s average less than 5 m/s and peak wind speeds are less than 8 m/s for at most 2s . In addition, the vector component of the wind speed across the test road shall be less than 2 m/s. Wind correction shall be calculated as given in 4.5.3. Wind correction may be waived when the lowest average wind speed is 2 m/s or less .
4.1.2.	Test road	
	The road surface shall be flat, clean, dry and free of obstacles or wind barriers that might impede the measurement of the road load, and its texture and composition shall be representative of current urban and highway road surfaces. ...	The road surface shall be flat, even , clean, dry and free of obstacles or wind barriers that might impede the measurement of the road load, and its texture and composition shall be representative of current urban and highway road surfaces.
4.2.1.6.	Test vehicle configuration	
	The test vehicle configuration shall be recorded and shall be used for any subsequent testing.	The test vehicle configuration shall be recorded and shall be used for any subsequent coastdown testing.
4.3.2.4.2.	During coastdown, the transmission shall be in neutral, and the engine shall run at idle. Steering wheel movement shall be avoided as much as possible, and the vehicle brakes shall not be operated.	During coastdown, the transmission shall be in neutral, and the engine shall run at idle . Steering wheel movement shall be avoided as much as possible, and the vehicle brakes shall not be operated.

WLTP ANNEX 4

REVIEW OF COASTDOWN TOLERANCES. AGREED CHANGES.

Paragraph	Old	New
4.2.1.7.4.	Closed panels	
	During the road test, the engine bonnet, manually-operated movable panels and all windows shall be closed.	During the road test, the engine bonnet, the boot lid , manually-operated movable panels and all windows shall be closed.
4.2.2.2.2.	Tread depth shall be measured before performing another road load determination with the same tyres but on another vehicle.	delete paragraph
4.2.2.3.	Tyre pressure The front and rear tyres shall be inflated to the lower limit of the tyre pressure range for the selected tyre at the coastdown test mass, as specified by the vehicle manufacturer.	The front and rear tyres shall be inflated to the lower limit of the tyre pressure range for the respective axle for the selected tyre at the coastdown test mass, as specified by the vehicle manufacturer.
4.3.1.3.1.	Following the vehicle warm-up procedure (paragraph 4.2.4. of this Annex) and immediately prior to each test measurement, the vehicle may be driven at the highest reference speed up to a maximum of 1 minute. The vehicle shall be accelerated to at least 10 km/h above the highest reference speed and the coastdown shall be started immediately.	Following the vehicle warm-up procedure (paragraph 4.2.4. of this Annex) and immediately prior to each test measurement, the vehicle shall be accelerated to 10 to 15 km/h above the highest reference speed and shall be driven at that speed to a maximum of 1 minute. After that the coastdown shall be started immediately.

WLTP ANNEX 4

REVIEW OF COASTDOWN TOLERANCES. AGREED CHANGES.

Paragraph	Old	New
4.2.3.	<p>Instrumentation</p> <p>Any instruments, especially those installed outside the vehicle, shall be installed in such a manner as to minimise effects on the aerodynamic characteristics of the vehicle.</p>	<p>"Any instruments, especially those installed outside the vehicle, shall be installed in such a manner as to minimise effects on the aerodynamic characteristics of the vehicle.</p> <p>“formula already in draft”</p> <p>If the effect of the installed instrument on $cd \cdot A$ is expected to be greater than $0,015m^2$ the vehicle has to be measured in a wind tunnel, fulfilling the criterion in paragraph 3.2.of this Annex, with and without the instrument and the corresponding difference has to be subtracted from f_2. At the request of the manufacturer, and with approval of the responsible authority, the determined value may be used for similar vehicles expecting to have the same influence of that equipment.</p>
4.2.4.1.1.	<p>Before warm-up, the vehicle shall be decelerated with the clutch disengaged or an automatic transmission in neutral by moderate braking from 80 to 20 km/h within 5 to 10 seconds. After this braking, there shall be no further manual adjustment of the braking system.</p>	<p>Before warm-up, the vehicle shall be decelerated with the clutch disengaged or an automatic transmission in neutral by moderate braking from 80 to 20 km/h within 5 to 10 seconds. After this braking, there shall be no further actuation or manual adjustment of the braking system.</p> <p>At the request of the manufacturer and upon approval by the responsible authority the brakes may also be activated after the warm-up with the same deceleration as described above and only if it is unavoidable.</p>

WLTP ANNEX 4

REVIEW OF COASTDOWN TOLERANCES. AGREED CHANGES.

Paragraph	Old	New
4.3.1.4.2.	These measurements shall be carried out in both directions until a minimum of three consecutive pairs of measurements have been obtained which satisfy the statistical accuracy p_j , in per cent, defined below.	These measurements shall be carried out in both directions until a minimum of three consecutive pairs of measurements have been obtained which satisfy the statistical accuracy p_j , in per cent, defined below.
4.3.1.4.3.	If during a measurement in one direction any external factor or driver action occurs which influences the road load test, that measurement and the corresponding measurement in the opposite direction shall be rejected.	"If during a measurement in one direction any external factor or driver action occurs which influences the road load test, that measurement and the corresponding measurement in the opposite direction shall be rejected. The maximum number of pairs that still fulfill the statistical accuracy as defined in 4.3.1.4.2. has to be taken and the percentage of rejected pairs of measurement must not exceed 1/3 of the total amount of measurement pairs. "