Starting note for the WLTP IG meeting in Vienna, 26-28 March 2014

OIL #14, #15, #16, #20: Torque meter for road load determination

> **Main open issue: progress on the torque meter method depends on budget available for running the validation program. Further definition of work packages will only start with the prospect of budget availability.**

In the WLTP-gtr (phase 1a) the torque meter is introduced as one of the alternatives to the commonly used coastdown methods to measure the running resistance as part of the road load determination. The torque meter is considered to be an promising option, but no actual measurements using a torque meter have been presented so far. Only theoretical descriptions of the torque meter approach are available. One of the advantage of the torque meter might be that measurements are done under positive torque, avoiding parasitic drags (e.g. electric braking or regeneration) during deceleration. If used for hybrids, no additional coastdown mode seems to be required.

During WLTP Phase 1a a need for further elaboration of the torque meter method was recognized, in particular on the following subjects:

- Validation of equivalency to the coastdown method (OIL#14). This includes general review of the method, its boundary conditions and the calibration methodology.

- Assess if additional provisions are required to accommodate measurements not only in ascending, but also in descending speed order (OIL#15).

- Adapt the torque meter method in such a way that it delivers the three coefficients required in the road load correction formulas in paragraph 4.5.5. of Annex 4 (OIL#16).

- Assess if error criteria for dyno settings using the torque meter method can be aligned with the 10N criteria of the coast down method (OIL #20)

Work package		Start	End	Lead	Assessment
1	Validation of equivalency to coast down method (OIL#14) - General review of torque meter method - Further consideration of additional requirements, like accuracy, position, 4WD, measurement of both vehicle speed and axle speed to prevent for tyre pressure variations, preconditioning, reference speeds, measurement time periods, etc. **Items missing?** - Test program to show equivalency. (Might be performed in one test, combining plateaus of constant speed with normal coast down deceleration in car equipped with both VBox and torque meter; should include results ascending – descending speed order)	After #6	#9	**OICA member ? (Ford?)**	Torque meter-group
2	Assess if additional provisions are required to	After #6	#9	Tbd	Torque meter-

	accommodate measurements in both ascending and descending speed order (OIL#15) - Program to be defined after results of ascending/descending validation tests under work package 1				group
3	Adapt the torque meter method that it delivers three coefficients f0, f1 and f2 for the road load correction formulas in paragraph 4.5.5. of Annex 4 (OIL#16) - Initial proposal by TNO to be discussed in the torque meter expert group	After #6	#9	Tbd (TNO?)	Torque meter-group
4	Assess if error criteria for dyno settings using the torque meter method can be aligned with the 10N criteria of the coast down method (OIL #20) - Review of differences and background of chassis dynamometer settings for coastdown and torque meter method. Web meeting with torque meter group. - If appropriate test program to compare methods. - If appropriate proposal to adapt torque meter method.	After #6	#9 (preferably)	Tbd	Torque meter-group

Expert group members:

Contact persons

- Rob Cuelenaere (TNO)
- Caroline Hosier (Ford)

Members

- Annette Feucht (Audi)
- Bjoern Ramacher (VW)
- Christoph Lueginger (BMW)
- Iddo Riemersma (expert)
- Kai Behlau (VW)
- Norbert Ligterink (TNO)
- Markus Bergmann (VW)
- Toshi Yamaguchi (JASIC)
- Open for new members