

Proposal from the Dual-Axis Dynamometer Task Force

This is the agreed text proposal that was developed by the Dual-Axis Dynamometer Taskforce. The taskforce's request to the WLTP-IWG is to adopt this proposal at the 21st meeting of the IWG on 9 January 2018, and to add this text to the informal document on Amendment 4 of GTR 15.

Proposal

Main body of GTR

Paragraph 3.2., add the following definitions:

- “3.2.31. *"Powered axle"* means an axle of a vehicle which is able to deliver propulsion energy and/or recuperate energy, independent of whether that is only temporarily or permanently possible and/or selectable by the driver.
- 3.2.32. *"2WD dynamometer"* means a dynamometer where only the wheels on one vehicle axle are in contact with the roller(s)
- 3.2.33. *"4WD dynamometer"* means a dynamometer where all wheels on both vehicle axles are in contact with the rollers.
- 3.2.34. *"Dynamometer in 2WD operation"* means a 2WD dynamometer, or a 4WD dynamometer which only simulates inertia and road load on the powered axle of the test vehicle while the wheels on the non-powered axle do not influence the measurement result, independent of whether they are rotating or not.
- 3.2.35. *"Dynamometer in 4WD operation"* means a 4WD dynamometer which simulates inertia and road load on both axles of the test vehicle.”

Annex 4

Paragraph 2.5.3., amend to read:

- “2.5.3. Application of rotational mass for the inertia setting

If the vehicle is tested on a dynamometer in 4WD operation, the equivalent inertia mass of the chassis dynamometer shall be set to the applicable test mass.

Otherwise, the equivalent inertia mass of the chassis dynamometer shall be set to the test mass plus either the equivalent effective mass of the wheels not influencing the measurement results or 50 per cent of m_r .

Add paragraph 7.1.0.:

- “7.1.0. Selection of dynamometer operation

The test shall be done on either a dynamometer in 2WD operation or 4WD operation, in accordance with paragraph 2.4.2.4. of Annex 6. “

Add paragraph 7.3.3.1.:

- “7.3.3.1. [Reserved for additional requirements relating to the vehicle restraint system for a 4WD dynamometer].”

Annex 5

Paragraph 2.3., amend to read:

- “2.3. Additional specific requirements for a chassis dynamometer in 4WD operation.”

Paragraph 2.3.1.1., amend to read:

- “2.3.1.1. Road load simulation shall be applied such that the dynamometer in 4WD operation reproduces the same proportioning of forces as would be encountered when driving the vehicle on a smooth, dry, level road surface.”

Annex 6

Add paragraph 2.4.2.4:

- “2.4.2.4. If the test vehicle has two powered axles, and under WLTP conditions is partially or permanently operated with two axles being powered or recuperating energy over the applicable cycle, the Contracting Party may require the vehicle to be tested on a dynamometer in 4WD operation which fulfils the specifications in paragraphs 2.2. and 2.3. of Annex 5.

- 2.4.2.4.1. If the test vehicle is tested with only one powered axle, the test vehicle shall be tested on a dynamometer in 2WD operation which fulfils the specifications in paragraph 2.2. of Annex 5.

At the request of the manufacturer and with the approval of the responsible authority a vehicle with one powered axle may be tested on a 4WD dynamometer in 4WD operation mode.

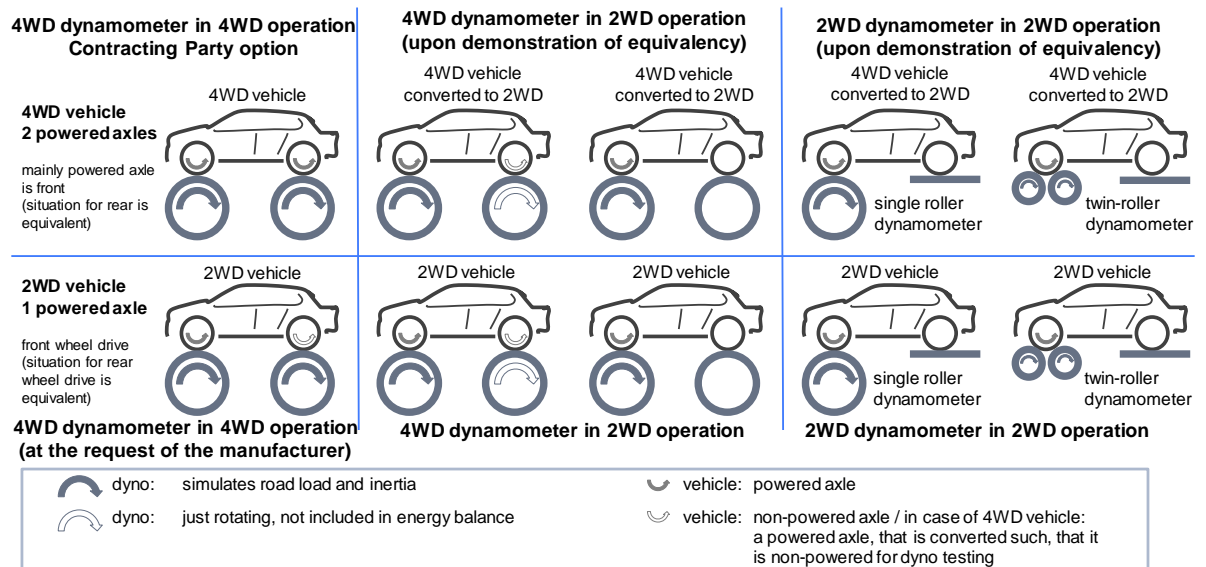
- 2.4.2.4.2. If the test vehicle has dedicated driver selectable modes which are not intended for normal daily operation but only for special limited purposes, such as ‘mountain mode’ or ‘maintenance mode’, or are only activated in an off-road situation, these modes shall not be considered when applying paragraph 2.4.2.4. unless they are classified as predominant according to paragraph 2.6.6. of this Annex

- 2.4.2.4.3. If the test vehicle is tested on a 4WD dynamometer in 2WD operation the wheels on the non-powered axle may rotate during the test, provided that the vehicle dynamometer operation mode and vehicle coastdown mode support this way of operation.”

Add graph to paragraph 2.4.2.4:

“Figure A6/2

Possible test configurations on 2WD and 4WD dynamometers



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Add paragraph 2.4.2.5:

“2.4.2.5. Demonstration of equivalency between a dynamometer in 2WD operation and a dynamometer in 4WD operation

2.4.2.5.1. At the request of the manufacturer and with the approval of the responsible authority, the vehicle which has to be tested on a dynamometer in 4WD operation may alternatively be tested on a dynamometer in 2WD operation if the following conditions are met:

- a. the test vehicle is converted to have only one powered axle;
- b. the manufacturer demonstrates to the responsible authority that the CO₂, fuel consumption and/or electrical energy consumption of the converted vehicle is the same or higher as for the non-converted vehicle being tested on a dynamometer in 4WD operation;
- c. a safe operation is ensured for the test (e.g. by removing a fuse or dismounting a drive shaft) and an instruction is provided together with the dynamometer operation mode;
- d. the conversion is only applied to the vehicle tested at the chassis dynamometer, the road load determination procedure shall be applied to the unconverted test vehicle.

2.4.2.5.2. This demonstration of equivalency shall apply to all vehicles in the same road load family. [At the request of the manufacturer, and with approval of the responsible authority, this demonstration of equivalency may be extended to other road load families upon evidence that a vehicle from the worst-case road load family was selected as the test vehicle.] “

Add paragraph 2.4.2.6:

- “2.4.2.6. Information on whether the vehicle was tested on a 2WD dynamometer or a 4WD dynamometer and whether it was tested on a dynamometer in 2WD operation or 4WD operation shall be recorded. In the case that the vehicle was tested on a 4WD dynamometer, with that dynamometer in 2WD operation, this information shall also indicate whether or not the wheels on the non-powered wheels were rotating.”

Paragraph 2.6.3.2, amend to read:

- “2.6.3.2. The dynamometer load shall be set according to paragraphs 7. and 8. of Annex 4. In the case that a dynamometer in 2WD operation is used for testing, the road load setting shall be done on a dynamometer in 2WD operation, and in the case that a dynamometer in 4WD operation is used for testing the road load setting shall be done on a dynamometer in 4WD operation.”