

## Via Nordica 2012



Jorge Soria Galvarro

### Calibration of roller brake testers transmission and use of reference brake force

This presentation is about NVF Report no. 1/2011 to investigate the uncertainty of the roller brake tester for heavy vehicles.

It summarizes the research carried out in this field in Scandinavia and suggests further steps to minimize roller brake tester's calibration uncertainty.

It also describes the method to evaluate brake performance of heavy vehicles with reference brake forces.

In NVF Report no. 1/2011 an uncertainty analysis was carried out of all the components influencing the calibration procedure of the roller brake tester and also an uncertainty analysis of the whole measurement process of this instrument.

The results showed that:

- the uncertainty analysis for the calibration procedure of the roller brake tester and the brake cylinder pressure gauges shows that the total measurement uncertainty for both calibration procedures are below the levels recommended by ISO 21069.
- the uncertainty analysis for the total measurement process for the roller brake tester is around 3% at normal operating load of 10 kN. This level is considered acceptable for the total measurement uncertainty of the roller brake tester.

However, experience from field tests show that some changes are recommended to improve the calibration procedures of the roller brake tester.

The calibration procedure could continue as it does today, but it should also include the following:

- To measure the actual diameter of the rollers and include it in the calibration program calculations.
- To verify that the brake calculation program version is the latest
- Rounding the values used in the calibration programs should not be allowed

The calibration procedure can be based on the manufacturer's recommendations or, for example, the one used in Finland.

It is important that the roller brake tester is standardized, so I recommend that:

- ISO 21069-1 should be the base for the roller brake tester specifications in the Nordic countries.

It is also important that the personnel performing the calibration and brake testing are suitably qualified, so I recommend that:

- Personnel calibrating the roller sets should have accreditation for the work.
- Personnel testing the heavy vehicles' brakes should have adequate training and continuous practice.

In a more practical way, in order to increase the level of confidence and find deviations, in the roller brake tester whole measurement chain, I also recommend:

- To implement a similar system in the Nordic countries like the random audit carried out in Finland.

This can be achieved with a measurement trailer or similar test device.

The calculation method for brake efficiency is important to harmonize in the Nordic countries, so I finally recommend:

- The use of the reference brake forces according to ISO 21995.

The implementation of this method could result in a more accurate and simpler method compared to today's national calculation formulas. This is also in line with directive 2009/40/EC.