

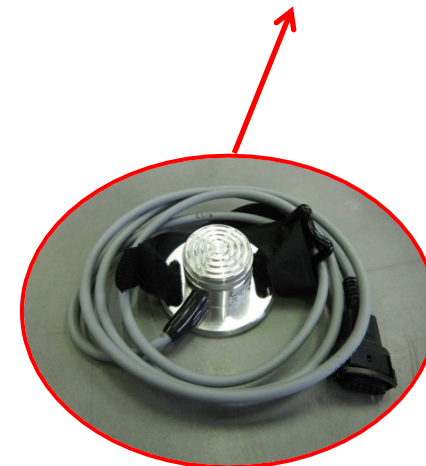
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# **Brake force extrapolation method for light vehicles with hydraulic brake systems in the Slovak Republic**

Peter Ondrejka, Marián Rybianský

# Roller brake testers (RBT) for light vehicles in Slovak PTI centres have to be equipped with pedal force sensors



*The pedal force sensor is connected to the RBT computer (by wire or wireless). Measured pedal forces and brake forces are transmitted from RBT to the central PTI information system via internet.*

# Methods for the brake efficiency evaluation

There are 3 methods being used for the service brake efficiency evaluation of light vehicles with hydraulic brake systems during PTI in the Slovak Republic:

1. Calculation of the braking ratio directly from the maximal brake forces measured during the test on RBT

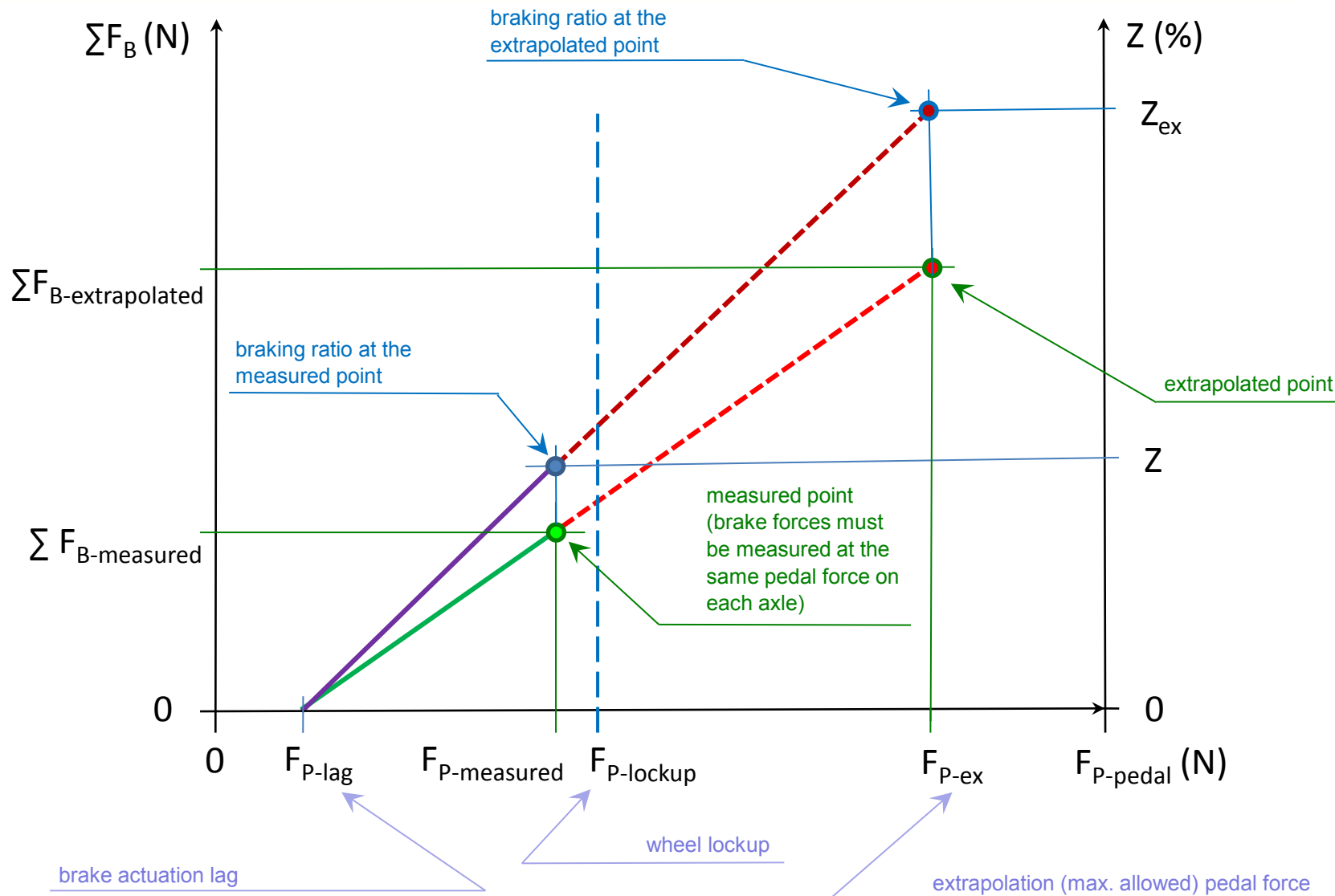
$$Z = 10.2 \frac{\sum F_b}{m} \quad (\%)$$

2. Calculation of the braking ratio using extrapolation.

*Note: It is mandatory to use this method when the braking ratio calculated by the first method is not sufficient to reach the prescribed value.*

3. Evaluation of the brake efficiency by the road test using decelerometer.

# One-point extrapolation method (hydraulic brake systems)



# One-point extrapolation method (hydraulic brake systems)

$$Z_{ex} = 10.2 \frac{\sum F_{B \text{ measured}}}{m_{GVW}} \cdot \frac{F_{P \text{ ex}}}{F_{P \text{ measured}}} \quad (\%)$$

Criterion:  $Z_{ex} \geq Z_{required}$

Brake efficiency as prescribed  
by the Directive 2010/48/EC

Max. allowed  
pedal forces:

$$M_1 = 490 \text{ N}$$

$$N_1 = 685 \text{ N}$$

$$T = 600 \text{ N}$$

## Weak point:

This method has been developed more than 20 years ago. The max. allowed pedal forces defined by the national Regulation are the same as in that time. For today's vehicles, the values are set too high.

1. Calculation of the braking ratio directly from the maximal brake forces measured during the test on RBT
- ~~2. Calculation of the braking ratio using extrapolation.~~      **New method**
3. Evaluation of the brake efficiency by the road test using decelerometer.

We are planning to start the development of a new method, that would replace the extrapolation.

The end



**Thank you for your attention**