Odometer Accuracy

OICA Position

OICA View on Tyre Diameter Tolerance for M1, N1

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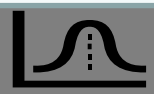

Tyre manufacturing tolerance: **±0.2%**

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Effect of rim size and rim tolerance[*1]: **±1%**

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Break-in effect[*2]: **+1%**

Tyre Tolerances **+4.2%/-2.2%**

*1: ETRTO does not provide for exact circumference-matching for different rim/tyre-size combinations
*2: tyre changes its shape; according ETRTO effect of permanent tire swelling after putting into service due to centrifugal forces and tire pressure

Test-to-test variation:
Axle load variations, tyre pressure accuracy, temp. control **±0.5%**
test instruments **±0.5%**

±1%

In addition to the electronic system tolerance, slide above, the total tolerance is composed of the tolerances defined by the tyre system plus the test-to-test variation. Stacking all up gives a tolerance of appr. ±5%.

Odometer electrical and electronics system: **±0.02-0.7%**

±0.7%

∑ **+5.9%/-3.9%**

Recommendation

The recommended total odometer tolerance does assume a certification test procedure where the tyre parameters are well controlled, including:

- Inflation to recommended tyre pressure for given vehicle loading condition
- Controlled tyre temperature
- Known tyre wearing status, resp. use of new tyre
- Controlled vehicle test-speed range

This results in a total tyre diameter tolerance range of +5.9% / -3.9%.
In real world there would be a shift of appr. -1% towards smaller diameters due to tyre wear (→ +4.9% / -4.9%).

Consequently, **OICA would recommend a tolerance of ±5% for M1, N1 for certification.**

A statistical combination of the individual tolerances (sqrt of sums of tolerances squared) is not recommended, as individual variations may not be statistically distributed around their nominal or center values, but may have systematic deviations.