



# **Performance Testing of TBR Tyres on a new Course**

Testing with TBR Steering Endurance Test Bench

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# PERFORMANCE TESTING OF TBR TYRES ON A NEW COURSE

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**T**BR tyres have a hard life. Different road surfaces and conditions, high loads, long distances and usually one or two retreads ensure a long service life. It is therefore of the utmost importance that the carcass, bead area and sidewall in particular, which are not replaced over the life of the tyre, are developed with the greatest care and tested for performance.

A key performance criterion is the straight-line stability of the tyres as well as their steering precision. This is particularly important in dangerous situations, for example during evasive manoeuvres. A situation that is becoming more and more common as traffic density increases. Measuring steering precision has been standard not only for PCR tyres

but also for TBR tyres, for years. Proof of performance is carried out, among other things, by measuring their cornering stiffness during operation. Here, lateral forces are measured as a function of the corresponding steering angle under stable testing conditions over the runtime of the test. Is this realistic enough?

If you look at the course of the evasive manoeuvre, you will notice that the manoeuvre itself does not take place under stable conditions at all. In the driving situation under consideration, the wheel load on the wheel on the outside of the curve is increasing with the increasing steering angle due to the changing weight shift of the vehicle, which is generally not replicated on the test benches.

In this article, Altracon presents a new TBR Steering Endurance Test Bench that allows precisely this critical driving situation to be recreated for TBR tyres. The changing lateral force to steering angle performance is precisely measured, taking into account a changing wheel load during the changing steering angle. The wheel is steered alternately to the right and left during the test, which is carried out with either force or steering angle control. The increase in wheel load over the steering angle is not changed during this test. The steering performance over time is the criterion for the sidewall endurance. Other test configurations can, of course, also be run on this test stand, such as standard endurance tests, constant steering angle, load variation etc.

The TBR Steering Endurance Test Bench consists of a 3m diameter drum with two testing positions, both taking wheels up to 1.400 mm diameter and can be steered +/-10° with a rate of change 0,1...5°/s.

The wheel carriers are guided with sliding elements in carriage guides for steering in addition to the central pivot bearing. This double bearing ensures stable positioning and particularly smooth running with increased robustness.

The nominal wheel load is 100 kN Fz, maximum 130 kN Fz, maximum lateral force is ±40 kN Fy, maximum speed is 100kph.

## Testing with TBR Steering Endurance Test Bench

Both wheel axles are equipped with a lateral hydrostatic bearing and a strain gauge measurement hub to measure Fy. This allows extremely precise measurements to detect even the smallest changes in the steering performance. Fz is measured in the load axle at the hydraulic cylinder.

Internal tyre pressure control and temperature measurements are, of course, integrated into the test bench.

The test bench is equipped with a new developed inbuilt daily calibration check device. This enables regular checking of the correctness of the measuring systems before the start of each test and guarantees the operator the necessary security in the traceability of the measurement results. The operator is guided through the procedure step-by-step via on-screen instructions.

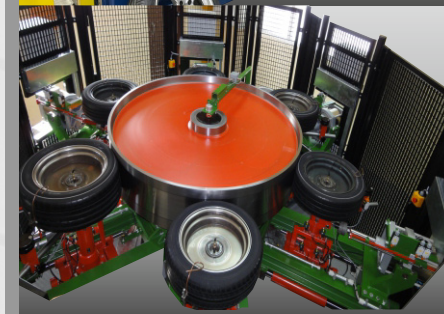
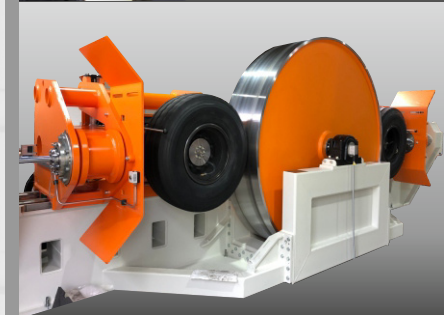
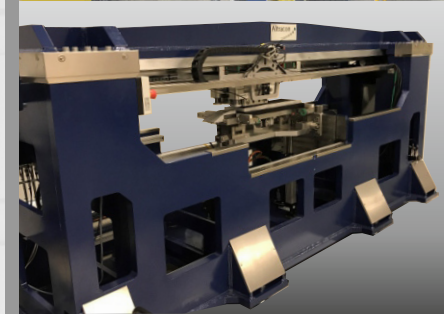
Altracon attaches great importance to sustainability when testing tyres and has also equipped this test bench with Altracon EPCM (Efficient Power Consumption Management), which ensures the most efficient energy management possible.

There is no doubt that this test bench sets new standards in technology and in evaluating TBR tyre performance. The performance testing of TBR tyres with this test stands obviously on a new course. ■



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