

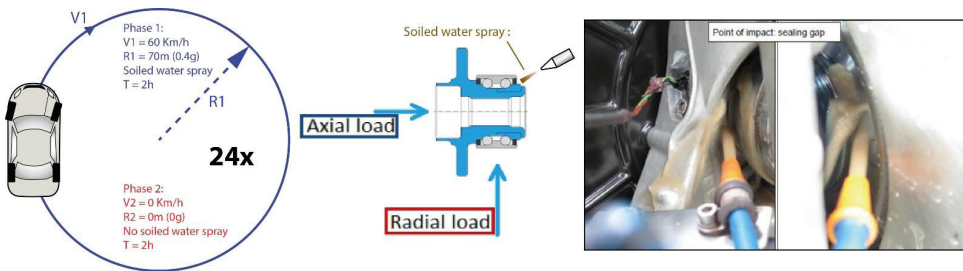
# DID YOU KNOW?

## WHEEL END BEARINGS SEALING PERFORMANCE TESTING

### ADVICE FOR THE PROFESSIONAL DYK22-12

In partnership with IAMT Engineering, MOOG has simulated extreme wet and dusty driving conditions. In a 24x replication sequence, the wheel-end bearings were subjected the harshest of tests:

1. Vehicle cornering for 2 hours on a circular track (radius  $\pm 70\text{m}$ ), at a constant speed of 60 Km/h, with the bearing permanently sprayed with soiled water, a mix of sand and salt.
  2. Vehicle stopped for 2 hours, to allow the soiled water to affect the bearing.
- Sequence replicated x 24.



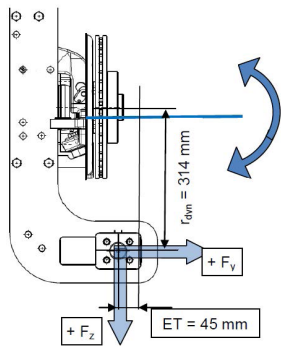
#### OVERVIEW

A wheel end bearing, like any other component in close proximity to the road, is susceptible to the intrusion of pollutants, especially:

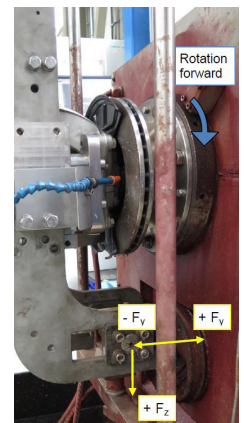
- **Water:** this dilutes the effectiveness of grease and in turn, the lubrication of the wheel-end bearing is no longer optimal and bearing wear is accelerated
- **Dust:** any ingress of dust or sand will result in premature wear
- **Salt:** winter road salt will significantly increase and accelerate corrosion
- **Sealing performance is critical to the durability and performance of a wheel-end bearing.**



#### Specification of durability / sealing test performance conducted on front left bearing of Audi A3 (MOOG Ref VO-WB-11019):

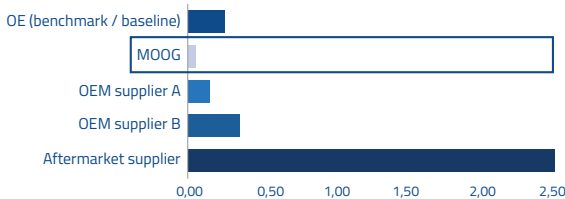


- **Phase 1:** 7.260 N (radial) / 2.900 N (axial) – 30s, then 3.920 N (radial) / -1.570 N (axial) – 30s, both with soiled water sprayed
  - Rotation speed = 500 rpm ( $\pm 60$  Km/h)
  - Soiled water composition : water (85%), sand (10%), salt (5%)
- **Phase 2:** vehicle stopped, no spray
  - All other fitted parts (e.g. wheel knuckle, brake pads, disc and accessories) were OEM references. All parts were tightened to manufacturer recommended torque values with forces applied at point of contact between tyre and road, taking into account wheel radius ( $R_{dyn}$ ) and rim offset ( $E_t$ ), as per illustration.
  - Monitored parameters were bearing temperature, amplitude/frequency of bearing vibrations, bearing clearance and bearing acceleration (torque maintained at 500rpm). Any deviation from set parameters automatically ended the test.



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Sealing performance : water intrusion in percentage points



Data provided in conjunction with IAMT Engineering, a globally recognised chassis systems testing and development organisation.

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