

DID YOU KNOW?

WHEEL END BEARINGS

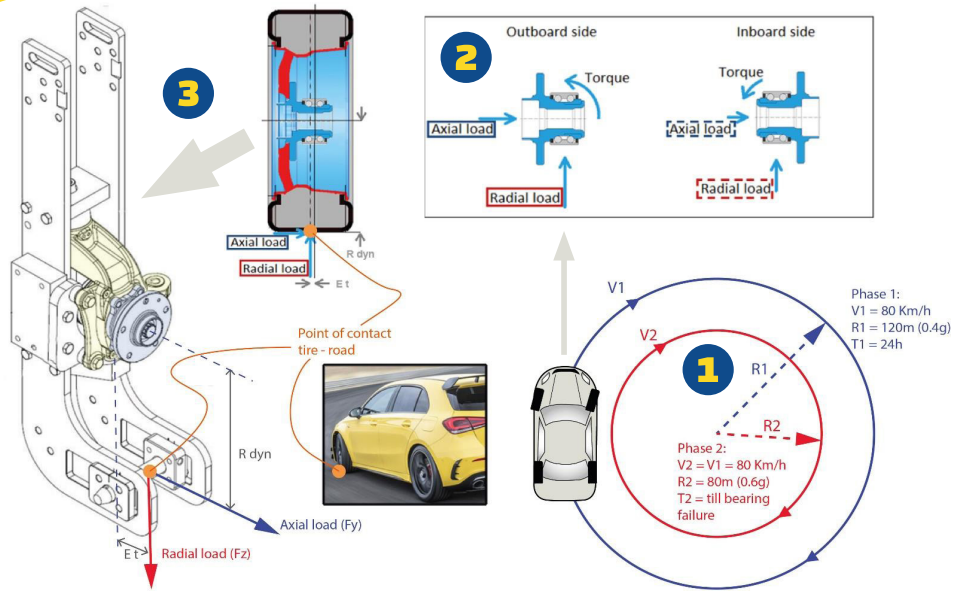
ENDURANCE/DURABILITY TESTING

ADVICE FOR THE PROFESSIONAL

DYK22-11

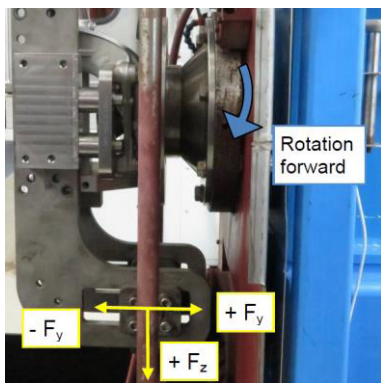
OVERVIEW

The highest load supported by a wheel end bearing, is reached while **vehicle is cornering**, since part of vehicle weight is shifted to wheels opposite to cornering direction, dramatically **increasing axial** and **radial forces** at that location. In partnership with IAMT, MOOG has simulated forces faced by a wheel end bearing fitted on a vehicle driving at a constant speed of 80km/h on a circular track of 120m and 80m of radius, allowing to reach respectively an acceleration of 0.4g and 0.6g **1**



2 Both axial and radial loads (F_y and F_z) are calculated for each tested vehicle (based on its weight, speed and track radius, ...) and replicated **3** on the testing bench, at the exact location where they are initiated (i.e. at point of contact tire – road, meaning that wheel radius R_{dyn} and rim offset E_t are also taken on board in the simulation).

Example of durability / endurance testing conducted on front left bearing of Audi A3 (MOOG Ref VO-WB-11019):

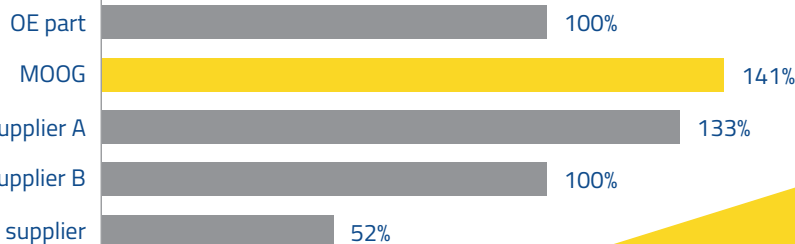


- Phase 1: 7.260 N (radial) / 2.900 N (axial)
- Phase 2: 8.930 N (radial) / 7.150 N (axial)
- $E_t = 45$ mm
- $R_{dyn} = 314$ mm
- Rotation speed = 700 rpm (± 80 Km/h)

- All other fitted parts (wheel knuckle, brake disc, ...) are **OEM** references
- All bolts/nuts screwed at **torque value recommended** by car Manufacturer
- Monitored parameters are bearing **temperature**, amplitude/frequency of bearing **vibrations**, bearing **clearance** and bearing **acceleration** (torque needed to keep 700rpm). They will be used to rank each sample



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

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