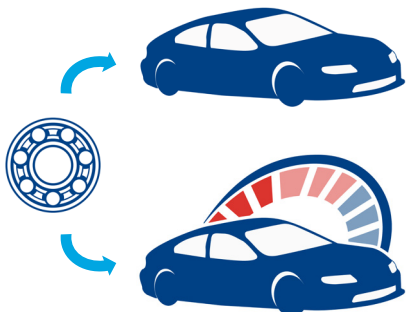


FRICION INSERTS CASE STUDY

HOW CAN STANDARD WHEEL BEARINGS BE USED ON HIGH-PERFORMANCE CARS?



In this case study, find ideas to:

- Implement same part strategy for various car models
- Benefit from economy of scale in procurement
- Reduce complexity in logistics
- Secure time-to-market

all with minimum development expenses

The customer is a premium German car manufacturer with a branch dedicated to high-performance cars.

CUSTOMER NEED

In order to fulfill the performance requirements of the high-power car model, the customer's engineers must redesign and reconfigure the wheel bearings. This is expensive and time-consuming due to the small annual number of performance cars in the production plan. Due to the compressed lead-time allowed between the launch of the standard model and the corresponding high-performance model, the development cycle, validation and approval process necessary for the redesign of the part can endanger the start of production date.

Therefore, the customer wants to use the same wheel bearings for both segments in order to avoid redesigning and reconfiguring the wheel bearings for the high-performance car model. The customer would not only like to keep the same part design, but also use the same assembling procedures. In addition to simplifying the design phase, the customer expects that using the standard components from its mass production program will help to improve its logistics, benefit from economies of scale and decrease the unit price of components.



Large-series model

6-cylinder engine

Power: **320 HP**

Torque on wheel bearing: **450 Nm**



High-performance model

6-cylinder engine

Power: **430 HP**

Torque on wheel bearing: **550 Nm**

The challenge

Using the same wheel bearings means that they must be able to withstand **+34% power, +22% torque**, and a change of the load collective in the connection which is significantly higher on the high-performance model than with the standard model. Furthermore, comparing performance cars with the standard operating conditions, the high torque transmission must be done with low contact pressure of the components.



SOLUTION

For the high-performance car model, we recommended using the standard wheel bearings from large series production and complement them with Friction Inserts in the joint in order to transmit the higher torque required. Due to the increase of the friction coefficient, Friction Inserts can lead to a significant increase in the transferable load spectrum.

Our experts provided the appropriate consultancy service to find the best point of application as well as the right time and place in the supply chain to apply Friction Inserts on the parts. We ensured sustainable quality, workload and optimized delivery from the Tier 2 supplier who applied Friction Inserts on their parts.



Friction Inserts applied on the wheel bearing.

RESULTS AND BENEFITS

- The use of standard wheel bearings together with Friction Inserts was proven successful by the OEM on the test rig and during the field tests of the new performance model.
- No extra expenses were needed on tools.
- No redesign was required.
- The same part strategy was made feasible.



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Freudenberg Performance Materials SE & Co. KG - Regional Business Unit Europe - 69469 Weinheim – Germany - frictioninserts@freudenberg-pm.com