TREMEC

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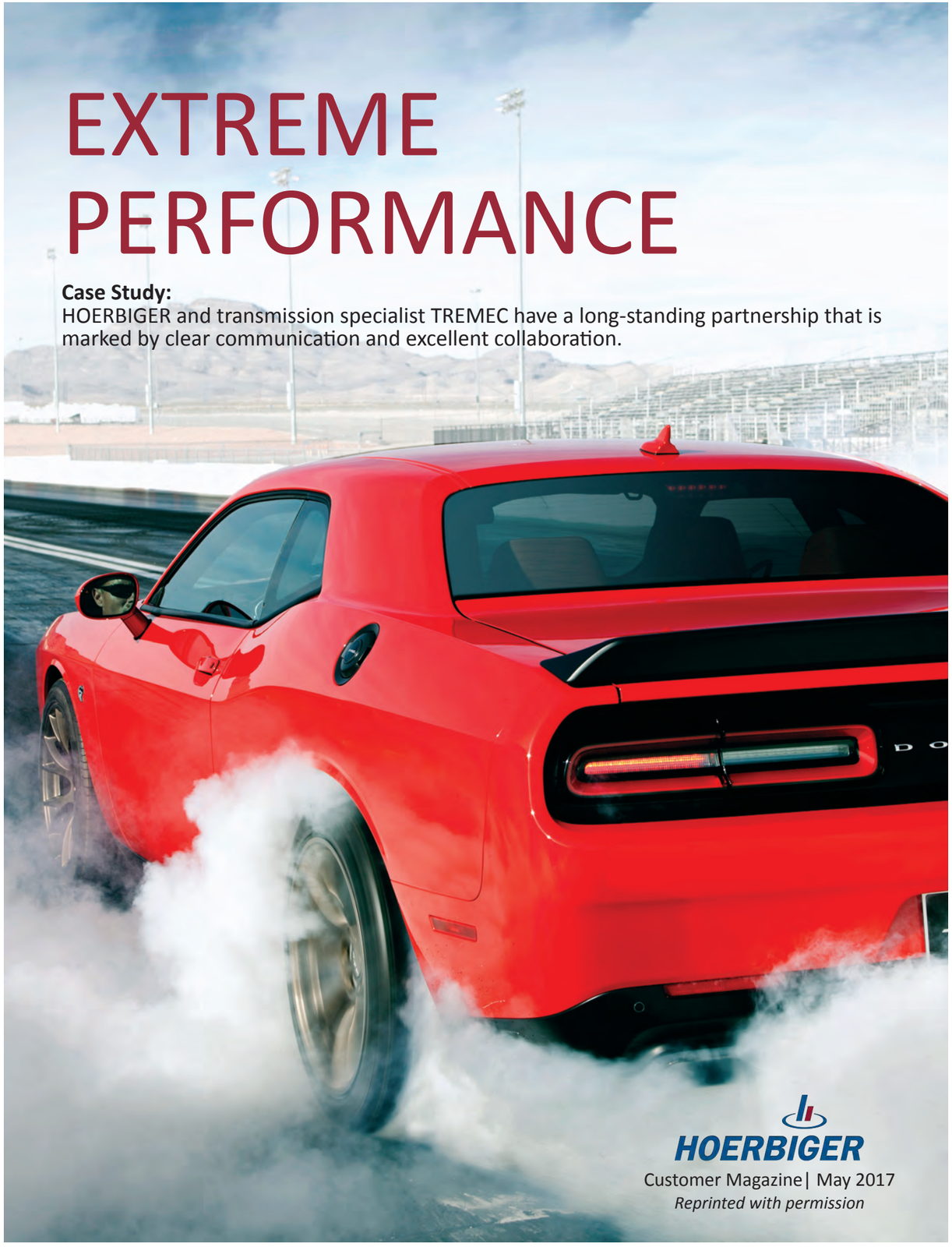
EXTREME PERFORMANCE

Case Study:
HOERBIGER and transmission specialist TREMEC have a long-standing partnership that is marked by clear communication and excellent collaboration.



HOERBIGER

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EXTREME PERFORMANCE

The long-term relationship between TREMEC and HOERBIGER is that of a partnership, with clear communication and excellent collaboration. Both companies contribute their technological know-how and share best practices to deliver innovative and first-class products.

Text: Claudia Maya
Photography: Fiat Chrysler Automobiles, Martin L. Vargas

In 2006, TREMEC entered the high-performance vehicle segment with the 6-speed TREMEC TR-6060™. The manual transmission can stand up to some of the highest-output V8 engines in the industry – after all, it was designed for very demanding, high-performance vehicles such as the Chevrolet Corvette and Camaro, the Dodge Viper, and the Dodge Challenger SRT Hellcat. These muscle cars have to be able to impress in the classic quarter mile test as well as endure in the 24-hour Le Mans marathon. The driving style is much different than with standard vehicles – these street-legal racing cars are more often pushed to the limit and exposed to extreme shifting behaviors.

High torque at a low cost continues to draw younger age groups to the thrill of affordable muscle cars. However,

About TREMEC

TREMEC (Transmisiones y Equipos Mecánicos S.A. de C.V.) in Querétaro, Mexico, is the leading manufacturer of rear-wheel-drive manual transmissions in North America. Approximately 1,000 employees produce on average 300,000 transmissions per year, with revenue last year coming in at around USD 240 million. As a wholly owned subsidiary of KUO Group, TREMEC is active worldwide. Aside from two plants in Querétaro, the company also has factories in Zedelgem, Belgium, and Wixom, Michigan.

TREMEC transmissions are manufactured according to the highest quality standards – not only in regard to the manufacturing process, but also the design concept. As such, the latest developments are integrated into the manual transmissions manufactured in Querétaro as well as the dual-clutch transmissions designed in Belgium. All TREMEC products, industrial designs, and manufacturing processes are intellectual property of TREMEC in Mexico, which has the exclusive right to manufacture and export worldwide.

“As partners we are committed to offering our end customers an ideal solution.”

Raúl Rayas Correa

1 A great example of the TREMEC and HOERBIGER partnership was the cooperation to resolve three issues at the same time: excellent cold-shifting performance, extremely low wear values, and high wheelspin capability.
2 The combination of sinter and carbon friction lining in one friction system enabled the gearbox to meet and exceed all three customer requirements – including the high number of wheelspin cycles.
3 Raúl Rayas Correa, New Products Development Manager at TREMEC

TREMEC’s trials.” The finished assemblies are tested at an icy -30 degrees Celsius and at top temperatures in Yuma, Arizona. To ensure that the needs of all customer groups are fully met, TREMEC engages test drivers with different levels of experience.

HOERBIGER contributes its technological expertise to improve the performance of TREMEC transmissions. “As partners we are committed to offering our end customers an ideal solution. This requires a strong relationship and open communication. If we need something, we know that we can consult the HOERBIGER specialists and that we can expect a very quick answer,” says Rayas Correa. And that’s one of the decisive criteria in the selection of a supplier, he feels: “HOERBIGER not only offers a technological solution, but also the know-how we need to cover customer demands.” Currently TREMEC and HOERBIGER are working on the next generation of transmissions.

system combines sinter and carbon friction linings and enables the gearbox with HOERBIGER synchronization to meet and even exceed all three customer requirements – including the high number of wheelspin cycles.

Wheelspins put enormous strain on the complete drive train. However, the TREMEC transmissions survive unscathed. “With our calculations, we are able to predict pretty accurately if the solution will work. But especially because oil has a great influence, there is always an element of uncertainty,” Hohenleitner explains. “Our simulations and hardware tests are an excellent complement for

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> “The requirements are very high – experienced and sporty drivers operate the shifting gears very differently than average drivers.”
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> Raúl Rayas Correa

many drivers in this new target group have little experience with manual transmissions. The result is new performance issues and demands: “The requirements are very high – experienced and sporty drivers operate the shifting gears very differently than average drivers,” says Raúl Rayas Correa, New Products Development Manager at TREMEC.

For the development of the new transmission, TREMEC counted on a key supplier who could support product development with expert knowledge: HOERBIGER. “Our collaboration started in 1999 with the implementation of HOERBIGER synchronizer rings in the TREMEC TR-3450™ 5-speed manual transmission,” says Klaus Hohenleitner, Key Account Manager at HOERBIGER in the Strategic Business Unit Drive Technology. “We attach great importance to taking

“We attach great importance to finding the best solution for every requirement.”

Klaus Hohenleitner

1 Klaus Hohenleitner, Key Account Manager at HOERBIGER in the Strategic Business Unit Drive Technology
2 TREMEC transmissions are manufactured according to the highest quality standards – not only in regard to the manufacturing process, but also the design concept.
3 HOERBIGER has been providing TREMEC with synchronizer rings, but more importantly providing solutions that play an important role in the development process.
4 Approximately 1,000 employees produce on average 300,000 transmissions per year, with revenue last year coming in at around USD 240 million.

a forward-looking approach to finding the best and most efficient solution for every requirement, whether for manual or dual-clutch transmissions.”

Equal partners

With TREMEC TR-6060™, both companies managed to resolve three demanding issues at the same time: excellent cold-shifting performance, extremely low wear values, and high wheelspin capability. For the wheelspin, which is well known in the motorsports world, the driver causes the rear wheels to spin by going from idle to maximum rpms, releasing the clutch with the first gear engaged, and stepping slightly on the brake so that the rear wheels spin with the vehicle staying in place. Then the second gear is engaged rapidly while the clutch and brake are suddenly released, creating a brute acceleration of the vehicle.

It took a lot of joint effort to define the requirements and to develop a viable solution: “Using the data given to us by TREMEC, we were able to calculate the exact demands,” says Hohenleitner. “In addition to the usual data, such as differential speed, masses in the gear box, and installation space, we also analyzed the resulting high energies and temperatures, and on this basis determined the optimal characteristics for simple and efficient synchronization.”

The joint strategy to use only two diameters in the double and triple cone versions and to employ miscellaneous friction linings was rigorously adhered to. The resulting hybrid friction