

## NTN-SNR ceramic ball bearing: development for Jaguar XE SV Project 8



NTN-SNR Roulements are honoured to have been chosen by the very select Jaguar Special Vehicle Operation (SVO) service to participate in the XE SV Project 8, a very high performance sports version of the XE saloon. It is intended to be driven both on the road and on a track for fans of the brand. To meet the specifications – a maximum reduction in the weight of the bearings, high reliability, high rigidity of mounting and a reduction in losses caused by friction – NTN-SNR drew upon its expertise in aeronautics and suggested ceramic ball bearings. To achieve this, it was necessary to respond to several technological challenges within a short space of time. Participation in this project demonstrates the confidence that Jaguar Land Rover has placed in NTN-SNR, who are one of their major suppliers, but also the confidence of other extremely

prestigious manufacturers. It is also a demonstration of the ability of NTN-SNR, a European leader in wheel bearings, to meet high-tech niche orders by using all its know-how and commitment to quality, reliability and safety with the prospect of later applying it to mass-produced vehicles.

### Expertise and high-tech knowledge at NTN-SNR

#### Adaptive technology

NTN-SNR decided to choose ceramic wheel bearing technology for the ball bearings used in the Jaguar XE SV Project 8. This technology has already been tested on single seaters and prototypes at the 24 Le Mans race. The first advantage of this technology is the savings in terms of weight of 210 grams per bearing.

This lighter weight of 840 grams contributes to the overall performance of the sports car, given that weight is a major criterion. In addition, ceramic ball bearings allow for better rigidity of mounting and a reduction in deformations when used under the particularly significant stresses experienced by the vehicle when driving in sports mode on a circuit. This ensures an excellent dynamic chassis, which is essential for a vehicle that can reach 320 km/h.

Finally, bearings equipped with ceramic balls will generate less friction loss, which is an advantage both in terms of sports performance and for reducing consumption.

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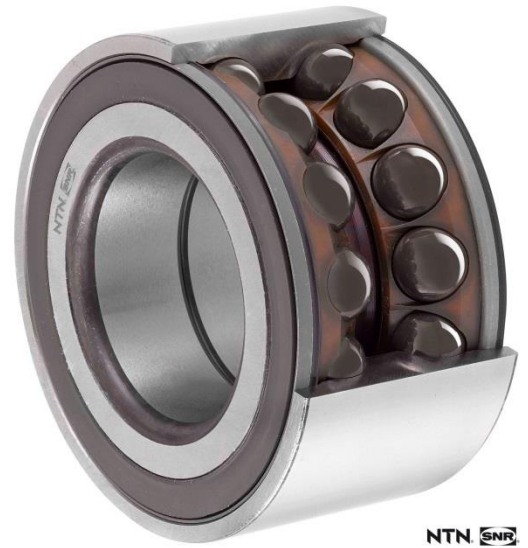
ООО «НТН-СНР РУС» (LLC «NTN-SNR RUS») • [info@ntn-snr.ru](mailto:info@ntn-snr.ru)  
Улица Викторенко, дом 5 строение 1, БЦ «Виктори плаза» 125167, Москва, Россия • Ulitsa Victoreenko, dom 5, stroenie 1, BC «Victory Plaza», 125167, Moscow, Russia  
ОГРН / OGRN 1147746194199 • ИНН / VAT 7714928767 • КПП / KPP 771401001 • Телефон / Phone +7 499 963 00 01

**NTN-SNR ROULEMENTS Европейская штаб-квартира • NTN-SNR ROULEMENTS European headquarter • [www.ntn-snr.com](http://www.ntn-snr.com)**

1 rue des Usines • BP 2017 • 74010 Annecy Cedex • France  
S.A. au capital de 123 599 542 € • RCS ANNECY B 325 821 072 • Id. Fiscale : FR 48 325 821 072 • Siret 325 821 072 00015 • Code APE 2815Z • Code NACE 28.15  
Phone / Телефон. +33 4 50 65 30 00

## A drastic test plan

These large diameter wheel bearings are cartridge-type bearings that are fitted by force on an aluminium pivot. One of the main difficulties that NTN-SNR had to solve was the difference in expansion coefficients between the aluminium of the pivot, the steel of the bearing, and the ceramic of the balls. The preload of the bearing was adjusted to obtain accurate compensation values and to check the integrity of the bearings under additional stresses on the test bench. NTN-SNR was therefore able to supply bearings with a lifetime of 451 000 km, as per the very strict specifications supplied by Jaguar. NTN-SNR's comprehensive testing plan addressed all issues related to these materials and the various stress levels, including the false Brinell effect (lubrication issues) or stiffness tests in turning effort to avoid any lamination that might result in permanent deformation. The bearing rings are manufactured at the production unit in Annecy-Seynod (Haute-Savoie, France) where the balls are also mounted and greasing before undergoing final checks in prototype workshop at the R&D unit in Annecy.



## A leader in the automotive sector, NTN-SNR has gained the confidence of major manufacturers for special projects

NTN-SNR has been the No. 1 supplier of wheel bearings for Jaguar Land Rover for many years. They placed their confidence in us in 2008 based on the guarantees offered by NTN-SNR regarding the supply chain, the premium quality of our products and the top-of-the-range technological expertise we provide. Today, there is genuine closeness between the two companies and it seems quite natural that SVO would ask NTN-SNR to support them with the Jaguar XE SV Project 8. NTN-SNR has already demonstrated its technical know-how on ultra-sports vehicles, including the Citroën racing team in the World Rally Championship from 1998 to 2011 with 9 World Championship titles for Sébastien Loeb. For this very exclusive project of 300 vehicles, everything has happened very quickly between the start of the project in mid-2016 and the going to market of the Jaguar XE SV Project 8, scheduled for September 2018. This project has been added to NTN-SNR's research plan and has helped to accelerate it in many ways. The ceramic technology can be adapted to other mass-produced vehicles. This is evidence of the permanent desire at NTN-SNR to invest in R&D and use advanced technologies to continually improve the performance of bearings from the perspective of reducing their weight, reducing energy consumption and reducing CO<sub>2</sub> emissions.



Press contact: Valeria Kulikova

28.09.2018

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ООО «НТН-СНР РУС» (LLC «NTN-SNR RUS») • [info@ntn-snr.ru](mailto:info@ntn-snr.ru)  
 Улица Викторенко, дом 5 строение 1, БЦ «Виктори плаза» 125167, Москва, Россия • Ulitsa Victoreenko, dom 5, stroenie 1, BC «Victory Plaza», 125167, Moscow, Russia  
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