Company Profile

Schaeffler is a leading manufacturer of rolling bearings and linear products. It ranks among the world’s major automotive suppliers and successfully serves almost all automobile manufacturers.

As a reliable engineering partner, we satisfy our customers by delivering an unmatched combination of creativity and exceptional innovative ability, convenient locations and immediate accessibility throughout the world, highest levels of quality in all our processes, as well as the ability to quickly respond to individual needs.

With its INA, LuK and FAG brands, Schaeffler is active in the automotive, industrial and aerospace sectors. Approximately 82,300 employees at 180 locations (FY 2015) around the world are dedicated to serving their valued customers wherever they may be located.

Due to our global network of R & D centers, manufacturing plants, and subsidiaries, we enjoy a strong presence with comprehensive engineering and production capabilities in all markets. Our expertise in state-of-the-art manufacturing technologies enables us to deliver the highest levels of precision, flexibility, and cost effectiveness in volume production.

Schaeffler Automotive: Engineering Centers all over the world

Wherever automobiles are built – we are nearby with the know-how and resources of our international group of companies, because successful teamwork starts in the development phase.

The Schaeffler Advantage - Optimized Performance

Our product range offers vehicle manufacturers and their customers maximum benefits:

- Extended operating life of vehicles via exceptionally developed components and assemblies made with durable materials.
- Reduced fuel consumption and increased efficiency through innovative transmission components and weight-optimized parts. Schaeffler is recognized as the leading specialist in deep drawn technology used to produce many of these products.

Products that contribute to reducing CO2 emissions which helps protect and sustain the environment.

Customer orientation with a strong focus on optimum system solutions for passenger cars to heavy trucks.

Customer specific innovations through efficient engineering and use of our state-of-the-art technologies such as; product design, dynamic calculation, simulation methods and system testing.

Group wide synergies and integrated approach to optimize costs, performance and quality deliverables.

To make the most of the many advantages our clutch release bearings offer... just ask us! We would like to talk about your application and partner with you to fulfill your needs.

Schaeffler plant with AL production

Schaeffler Application and Product Engineering

Schaeffler Automotive: Engineering Centers all over the world
A Brief History of Clutch Release Bearings

The first clutch release bearings were simply bronze or carbon cartridges mounted in a cast iron or forged trunnion. Prevalent in the early 1900’s, this type of arrangement was subject to a high degree of wear resulting in frequent replacements.

In the early 1930’s, anti-friction ball bearings began to replace the carbon and bronze cartridges, but by the mid to late 1930’s, a change in the appearance of clutch release bearings became noticeable. The introduction of a fixed guiding tube, necessitated a larger bearing but achieved a much more stable system.

Through 1940’s and 50’s, the majority of advancements made in clutch release systems were from the standpoint of reducing size while increasing reliability. Great developments were made with regard to grease quality and seal materials. All of these factors combined, contributed to a much more predictable bearing life.

Efforts toward weight and cost reduction continued into the 1960’s. Then in 1967, a patent was granted for a self-centering clutch release bearing. This new feature enabled the bearing to find its own rotational center with the clutch diaphragm spring. This innovation helped reduce bearing operating temperatures by 25%, while increasing service life by 400%.

By the 1970’s, plastic carriers came on the scene as a means to further reduce weight and cost. From that point on, improvements in processes and new materials development continued to extend the service life as well as improving overall performance of the clutch release system.

Furthermore, we don’t just focus on the clutch release bearing but rather, the entire clutch release system. By doing so, we can design mating components in an integrated way achieving a better optimization. For example, in the critical area of the guiding tube and it’s interaction with the clutch release bearing housing, Schaeffler has been able to overcome the problems of a greased interface by designing special plastics and hardened guiding tubes leading to a dry, maintenance free assembly.

Schaeffler is responsible for many technology improvements of clutch release bearings to their current level. As a world leader in automotive technology, we are committed to achieve further advancements through continued excellence in design, manufacturing and quality initiatives.
**Special Products and Applications**

### Self-Aligning Bearing

The self-aligning clutch release bearing allows a perfect distribution of engage / disengage loads to the clutch diaphragm spring fingers. This effective load distribution creates a better opening and closing balance with the pressure plate over the clutch disc, thus providing stable torque transfer between the engine and drive train, and reducing vibration throughout the system and specifically, in the clutch pedal.

### Optimized Clutch Contact Bearing

This design with optimized clutch contact has a special plastic washer to reduce contact friction between the bearing and the clutch diaphragm spring fingers, increasing efficiency of the actuating systems. During the operating life, this feature will reduce variation in the actuating force, reducing bearing slip and therefore, prevent fretting corrosion from contact between the bearing and clutch.

### Complete Release Unit

Our broad product range means we can also provide a complete release unit module. The complete unit provides the best and most functional design. Using advanced calculation and design methods enable us to create the best design for the application, saving space, reducing weight, and minimizing cost through the use of the proper materials and production technology. For example changing from a forged to a deep drawn lever.

### Heavy Truck Clutch Release Bearings

Schaeffler has special ball bearing designs for pull type clutches used in medium and heavy duty truck applications. These bearings have specially designed rings and seals to withstand the extreme operating conditions of high loads and high temperature. Also, Schaeffler’s production competence from stamped parts to forging and machining parts, allows us to supply the complete clutch release bearing - the ball bearing, bearing housing, and fixing parts. We also have hi-tech controlled test stands that simulate real operating conditions for heavy duty truck clutch release bearing applications, on which our clutch release bearings are tested and validated.

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**From Theory Into Practice**

### Design

Customer specific bearing systems and components are routine for Schaeffler. The use of state-of-the-art design tools such as CAD is commonplace and beneficial for both parties.

### Calculation and selection

By using our in-house developed calculation software BEARINX®, we are able to model and calculate complex shaft systems as well as entire transmissions. The internal loads of all bearing types right down to individual rolling element contact are calculated and displayed, and thus, BEARINX® accurately determines the calculated operating life of the bearing system.

### Simulation

In the design and modeling phase, state-of-the-art methods such as dynamic simulation and FE analysis are used. By means of “rapid prototyping,” the customer can even order a dimensionally accurate model that can be tested for fit and function.

### Testing

Only then – after optimization – does a product move to testing. By request, our customer’s prototypes can be tested in all situations and for all functions in one of our hi-tech R & D centers around the world. Tests are carried out from wear behavior to noise range, isolated within the surrounding modules or in an actual vehicle. Only after a series of severe, application-oriented tests, can production be started with confidence.
Every care has been taken to ensure the correctness of the information contained in this publication but no liability can be accepted for any errors or omissions. We reserve the right to make changes in the interest of technical progress.

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