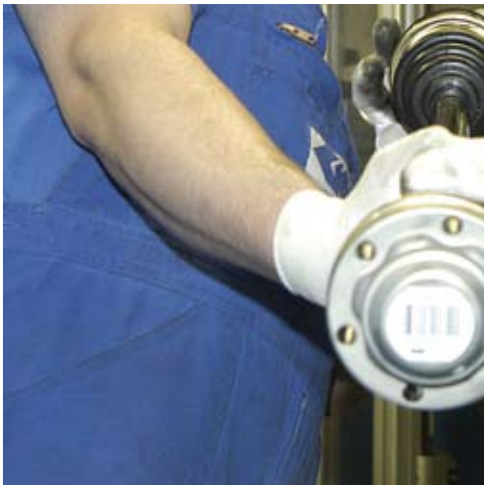
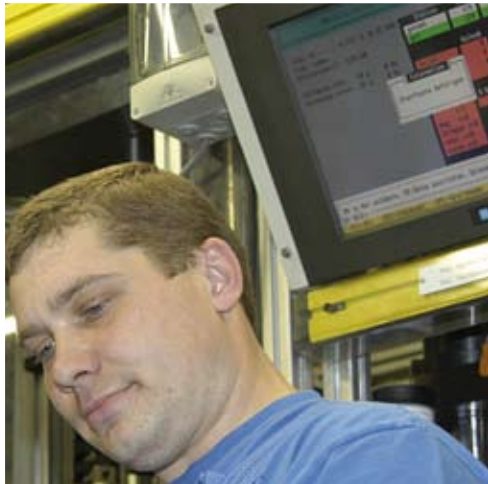
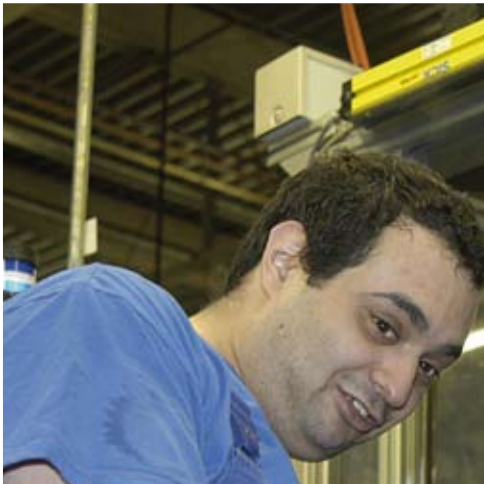




GKN Driveline Driveshafts





GKN Driveline is the world's leading supplier of automotive driveline components and systems. Our global market leadership is based on a strong engineering heritage and 21,000 people at more than 40 locations in over 30 countries.

Driving the future

GKN Driveline supplies premium propshafts and constant velocity (CV) sideshafts for all kinds of passenger cars and light commercial vehicles. Our reputation for delivering unique driveshaft systems is built on our innovative approach to designing, developing and refining solutions which meet and exceed performance targets to transmit power safely, reliably and with a high degree of comfort. Through our dedicated plants worldwide we supply more than 127,000 driveshafts daily, supporting our commitment to product quality and innovation with total supply chain management.



Propshafts: each GKN Driveline premium propshaft is unique in its use, tailored, tuned and harmonised to match the precise demands of its application. Propshafts consist of shafts, joints and bearing, and transmit torque between gearbox and axle in rear-wheel drive vehicles and from the transfer box to the front and rear axles in all-wheel drive vehicles.

Sideshafts: Alex Issignosis' revolutionary front transverse-engined car with front-wheel drive used GKN sideshafts. Today, more than 40 years on, GKN sideshafts are the first choice of leading vehicle manufacturers around the world for all kinds of front-wheel, rear-wheel and all-wheel drive applications.



Key features

- One, two and three piece configurations
- Single and double Cardan joints
- Range of fixed ball joints, plunging ball joints and tripod CV joints
- Range of crash features
- Range of NVH damping systems
- High precision balancing capability
- Friction, Mag-arc, laser and plasma weld technologies
- Steel, aluminium or composite tube materials
- High and low angle solutions
- Flexible rubber couplings
- Custom-designed brackets

Key benefits

- Weight reduction through optimised material and joint selection
- NVH analysis and tuning
- Optimised high speed durability
- Torsional stiffness
- Crash compliance



Each propshaft – a unique, engineered product

Strength, stiffness, precision balance and low mass are the essential properties of propshafts in ensuring durability and minimum levels of Noise Vibration Harshness (NVH). Shaft joints and couplings also have to accommodate severe service loads, high angles and apparent changes in path length, due to relative displacement between axles and the gearbox in passenger cars, and the high 'shock' loads commonplace in all-terrain vehicles.

The crash-optimised shaft

An innovation in vehicle safety engineering, the crash optimised shaft provides predictable energy absorption when required, or can be tuned to a required combination of load and displacement. For example, the tube can be designed to absorb a specific amount of impact load before collapsing to a predetermined length. Shafts can be produced in aluminium and composite fibre to provide energy absorbing characteristics, and CV joints designed with specific energy absorption features. GKN Driveline's unique capability and innovative lead in crash optimised shafts ensures a safer and more comfortable driving experience.

Direct Torque Flow (DTF) Connection

The DTF offers a direct connection to the gearbox or the differential without a flange by transmitting torque from the CVJ inner race to the output shaft. By eliminating components the system weight is reduced, the bending frequency is increased and the outer diameter of the joint is smaller. The imbalance is improved and the assembly time to the vehicle is reduced. This configuration can be applied to all joint types.

A sideshaft for every application

The sideshaft provides the dynamic connection between engine and driving wheels, transmitting power and allowing steering angles whilst accommodating suspension movements and isolating vibrations. Each sideshaft has two constant velocity joints – a fixed joint at the wheel end and a plunging joint at the gearbox end, connected by an interconnecting shaft. At GKN Driveline we appreciate the impact of these critical components on a vehicle's dynamic performance, noise, vibration, durability, efficiency and weight saving, and their key role in enhancing power delivery, handling and comfort. Our new generation of advanced sideshafts is the result of a continuing commitment to researching and developing new means to optimise and improve total sideshaft performance, each fully supported by our long experience from the very first days of sideshaft application.



Key features

- More than forty years of leadership in sideshafts development and innovation
- Unrivalled global expertise in sideshaft design for front-wheel, rear-wheel and all-wheel drive vehicles
- ... and applications in all kinds of vehicles: electrically-operated, light trucks, sports cars, luxury cars, 4x4 vehicles
- Over 44 million sideshafts produced yearly
- Comprehensive portfolio of fixed ball, tripod plunging and ball plunging joints

Key benefits

- Improved space utilisation through power unit and gearbox repackaging potential
- Lighter weight provides improved fuel efficiency
- Better driving characteristics and comfort
- Optimum power delivery for peak vehicles



Our Propshaft range



With an increased market demand in all-wheel drive vehicles, GKN Driveline is at the forefront in propshaft technology – providing the world’s leading vehicle manufacturers with the ultimate driveline configurations.

High speed joints

High Speed Fixed Joint – HSAC

The high-speed AC (HSAC) joint is a six ball joint. It can be used to replace cardan joint operating angles up to 15 degrees, without the noise issues of non-CV cardan joints. The HSAC operates well in all vehicle types.



High Speed Fixed Joint – PX

The high speed PX countertrack™ joint is the next generation of the HSAC joint. The PX is an opposed track 4+4 design fixed ball joint. It is highly efficient compared to all other joint types and allows operating angles up to 15 degrees.



High Speed Fixed Joint – PXS

The high speed PXS joint is an opposed track 5+5 design fixed ball joint. The PXS has an extremely narrow package. It can be used in operating angles up to 3 degrees and due to the opposed track design it has very high efficiency.

High Speed Tripod Plunge Joint – HSGI

High speed tripod joints are used where installed angles are low, but axial (plunging) motion is needed. This type of joint is often used in all-wheel drive vehicles to prevent engine movements or vibrations from being transmitted into the passenger compartment. The high speed GI (HSGI) joint requires a very low dynamic plunge force and can be used in operating angles up to 2 degrees.

High Speed Plunge Joint – PDO

The High Speed PDO joint is a plunging ball joint with similar benefits to the tripod joint, and is used in similar applications. The PDO joint also exhibits low rotational lash, which helps improve driveline NVH (noise, vibration harshness) characteristics. It can be used in operating angles up to 3 degrees.

High Speed Plunge Joint – HSVL

The High Speed VL (HSVL) joint is capable of running at high installed angles, and its plunging properties allow for dynamic driveline motion or variations in vehicle build tolerance. HSVL joints are capable of plunging up to 60mm, running at high installed angles and high rotational speeds.



High Speed Plunge Joint – PC

The high speed PC joint combines features from the DO and VL joints, which gives it excellent performance in dynamic plunge and backlash. It is especially suited to hang-on all-wheel drive systems with transverse engines. It can be used in operating angles up to 7.5 degrees.



Our Sideshaft range



Because we understand the requirements and characteristics of front-wheel, rear-wheel and four-wheel drives, we design to meet the varying needs of all types of vehicles from the electrically-operated through to light trucks, sports cars, luxury cars and 4x4 vehicles.

Fixed Ball (AC) Joint

The AC joint is suitable for passenger cars and light vehicles. Providing a maximum articulation angle of 47 degrees to meet the criteria for steering and suspension movement, it is the most popular choice for the wheelside of a constant velocity sideshaft.

Fixed Ball (UF) Joint

Offering the same strength and durability as the AC joint, the UF joint provides the maximum 50 degrees articulation angle, so affording greater latitude in the design of the steering geometry and facilitating smaller turning circles.

Fixed Ball Joint – SX



The new SX countertrack™ joint uses the principle of “opposed tracks” for significant packaging reduction and efficiency improvement and combines this with a specific track shape profile in longitudinal direction to allow angles of 50 degrees and more. This breakthrough technology sets the new benchmark for constant velocity joints on the outboard side.

Fixed Ball Joint – SIO plus Ballspline

The SIO joint for inboard use is based in the “opposed track” principle to provide high performance in smallest packaging with optimised joint efficiency. Together with the ballspline as plunging unit, it represents a premium solution for extreme plunge angle requirements and high installation angles, as for instance needed for SUV vehicles.





Tripod Plunging (GI) Joint

The standard tripod joint GI is suitable for the inboard gearbox joint of a constant velocity sideshaft for most vehicles. It has a maximum articulation angle of 23 degrees and has a plunge length of 50mm. It is ideal for medium working angles and its low plunge resistance aids good NVH characteristics.



Tripod Plunging (AAR) Joint

In addition to the properties of the GI joint, the low plunging resistance and low axial forces of the AAR joint deliver additional NVH refinement, making it appropriate for high working angles. It has a maximum articulation angle of 26 degrees and 50mm plunge.



Ball Plunging (VL) Joint

The VL ball plunging joint is a popular choice for the inboard joint of the rear-wheel drive CVJ sideshafts. With maximum 22 degrees articulation and a plunge of 50mm it is ideal for high working angles with low axial forces. The VL joint is also available as monobloc or disc version.



Ball Plunging (DO) Joint

The DO joint is similar to the VL. It is available in two versions with 50mm plunge for a maximum articulation of 26 degrees or 31 degrees. The DO joint is also suitable for high working angles on account of the low axial vibration.



Ball Plunging Joint – SC



The new SC crosstrack™ joint, a new addition to the plunging joint portfolio, was developed for improved NVH. This shudderless joint combines the premium performance of tripod plunging joints in terms of small plunging force with the premium performance of ball plunging joints in terms of reduced backlash.

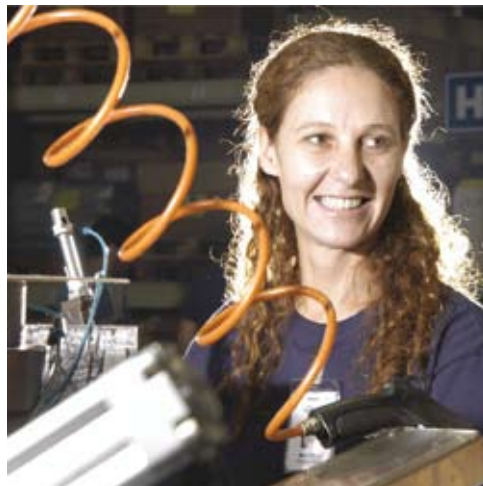


Our global commitment



GKN Driveline boasts a global network of support. With Research and Product Development Centres in the United States and Germany plus additional local customer application support and manufacturing plants worldwide, our customers can instantly draw on a wealth of shared knowledge and expertise assimilated across all continents.

That means that our customers can be assured that we will understand their unique application needs and that our comprehensive portfolio of products and processes as well as experience will always deliver the highest performance. What's more, by sharing our global capability we are also able to significantly reduce new product development lead times, so keeping our customer one step ahead of the game.







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