



Mechanics® Driveshafts

PRODUCT CATALOGUE

MECHANICS® SYNERGY DRIVESHAFTS



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DRIVESHAFTS PRODUCT RANGE

CARDAN SHAFTS >

GKN's application-matched cardan shafts are rugged assemblies that withstand the requirements of today's more powerful engines and transmissions. Precision balancing assures smooth, vibration-free operation. GKN's wide range of cardan shafts are backed by years of proven performance in some of the most extreme applications. They have set the industry standard for quality for years, and are backed by the technology, systems and people to meet even the highest expectations.



DOUBLE UNIVERSAL JOINT (DUJ) SHAFTS >

The DUJ range for the off-highway sector include DUJ shafts for vehicles with driven steering axles, DUJ shafts for sterndrives for boats and Universal-joint shafts for special applications.



CONSTANT VELOCITY (CV) SHAFTS >

The CV-sideshafts with Constant Velocity ball joints are used in vehicles with independent suspension. These driveshafts represent an alternative to conventional sideshafts with centered double cardan joints. A wide range of different joint sizes are available.



CENTRED DOUBLE CARDAN (CDC) SHAFTS >

The sideshafts with centered double cardan joints are especially developed for extreme working conditions and allow high continuous angles at high speed. The joints are robustly designed, and also have a maximum deflection angle of 50°, thereby guaranteeing maneuverability of the vehicle. These shafts are predestined for the use in all-terrain vehicles.



PTO SHAFTS >

We also design and manufacture an extensive range of Power Take Off (PTO) shafts for the agricultural industry under the Walterscheid brand.



CARDAN SHAFTS



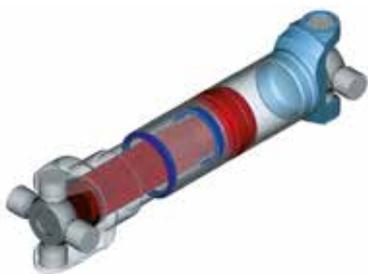
GKN Cardan Shafts are available in a complete range of sizes for off-highway and industrial applications. GKN take pride in working closely with customers to understand the demands of the end product and develop shafts optimised to the true requirements.

Alongside a wide variety of industry standard sizes and connections, GKN also has the ability to deliver shafts with custom flange and stub end configurations, ensuring that all components in the power transmission system can be linked. The quality of GKN driveshafts and components, alongside understanding of customers applications, add real value and integrity to the product offering.

With a global manufacturing footprint, GKN can supply Cardan Shaft products worldwide. Aftermarket support is a key element to the service offering and full assemblies can be supplied for the complete product range. In addition, an extensive network of service facilities across Europe allows for the repair and remanufacture of all Cardan Shaft products.



MECHANICS® / C-TYPE > Genuine Mechanics® Universal Joints have set the industry standard for over 40 years. Each is specially designed to facilitate field or shop servicing, making U-joint removal and replacement simpler, faster and cleaner. Mechanics® C-Type U-Joints are available in wing-style, block-style and combination configurations, and can be either service free or re-lubeable. Many designs offer a patented “Interlock” feature, and precision, close tolerance dust shields keep out dirt, debris and contaminants, virtually eliminating the greatest cause of internal bearing wear. GKN’s unique dual-profile seal retains lubrication, and assures a balanced purge and lube of all bearings during lubrication. Mechanics® Universal Joints offer value to the end user that becomes more apparent day after day over the products’ extended service life.



SAE ROUND BEARING > GKN offers a complete line of conventional round bearing driveshafts and components available as maintenance free, permanently lubricated or fully re-lubeable configurations. These versatile, heavy-duty, off-highway u-joints and components are directly interchangeable with common industry sizes.



DIN / XS / SAE FLANGED SHAFTS > GKN offers a variety of shafts over a wide range of torques that are configured for standard DIN and XS flanges. Shafts are available in either service free or re-lubeable configurations, and are directly interchangeable with industry standard products.

GKN MECHANICS® – SYNERGY SERIES

A key feature of the 3C-10C product range is the service free design which is achieved through optimisation of the spline geometry and spline grease for off-highway loads and temperatures and advanced slip seals.

Specialised design of the splined components has allowed for increased length compensation. It has also given improved balancing characteristics to allow for a smoother running shaft, thereby improving operator comfort. Finally, increases in torque capacity and service life result in longer operating time, shorter downtimes and ultimately, higher profit margins for the operator.



PRODUCT PHILOSOPHY >

The range has been developed by linking existing, proven GKN off-highway technologies from our market-leading Mechanics® Series U-Joints range with inverted slip and shaft design expertise from engineers across the GKN group. The 3C-10C range is a natural evolution of existing GKN product innovations with new features and benefits to offer significant advantages to customers in the off-

highway market. In the main these improvements will reduce weight, reduce the need for servicing and maintenance, and maximise uptime and productivity.

Application-matched drivelines are rugged assemblies that withstand the demands of today's more powerful power train requirements.

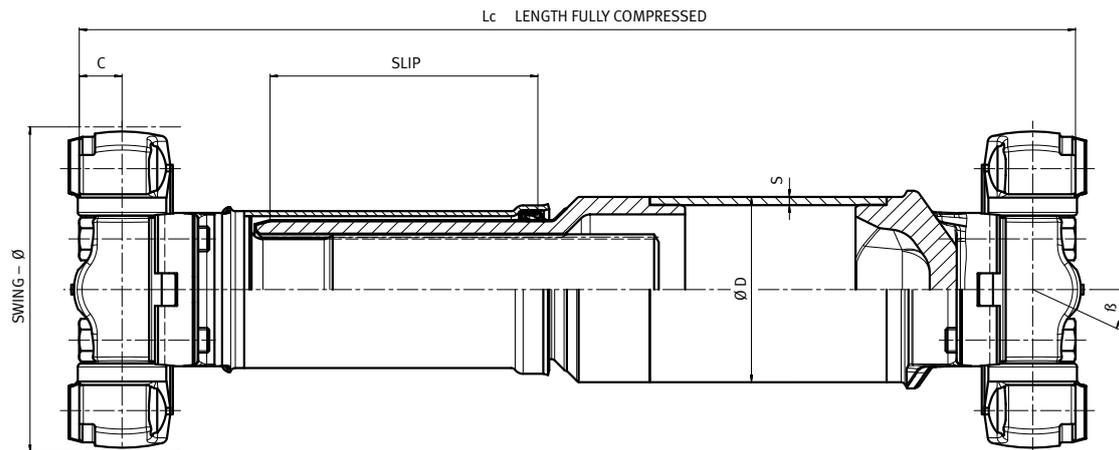
GKN SYNERGY >

- > service free design
- > reduced weight
- > improved sealing
- > increased slip length
- > retro fitting possible (fully interchangeable with existing Mechanics® shafts)
- > spline grease is optimised for the off-highway environment
- > unique design geometry extends and maximises bearing-load capabilities
- > high degree of standardisation of components
- > improved balancing characteristics

GKN's Driveshaft products are available for supply across Europe, the Americas and Asia.

Fixed/Slip Shaft FS

Driveshaft with length compensation
Mechanics® Synergy standard version with tube



Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle β [°]	TUBE ØD x S [mm]	Lc min. [mm]	SLIP [mm]
3C	2400	340	96,8	15,5	20	60 x 2	267	60
							297	90
							337	130
4C	3100	430	114,3	15,5	25	63.5 x 24	tbd	70
								90
								130
5C	5700	760	121,4	17,5	25	70 x 3.5	318	80
							348	110
							368	130
6C	7000	885	148,3	17,5	30	80 x 3.5	331	80
							371	120
							396	145
7C	10500	1425	158	20,6	25	90 x 4	360	90
							400	130
							425	155
8C	15300	2120	215,9	20,6	30	100 x 4.5	420	105
							445	130
							470	155
8.5C	20000	2440	174,8	25,4	25	100 x 6	435	100
							465	130
							495	160
9C	27000	3290	218,9	25,4	25	115 x 6	471	110
							511	150
							551	190
10C	39000	5130	225,6	32,5	25	130 x 7	569	110
							609	150
							649	190

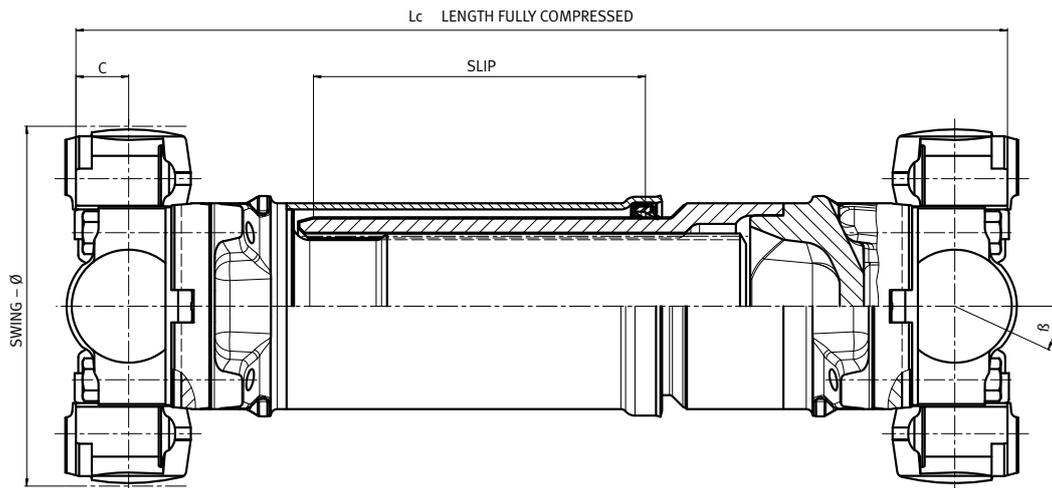
TCs = Functional limit torque – static Torque Capacity – No yielding or plastic deformation up to this torque limit

Td = Continuous operation torque – dynamic Torque – approx. 3000 hours operation at speed 2000 RPM and 3° angle

Short Coupled Shaft SCS

Driveshaft with length compensation

Mechanics® Synergy short version without tube – welded



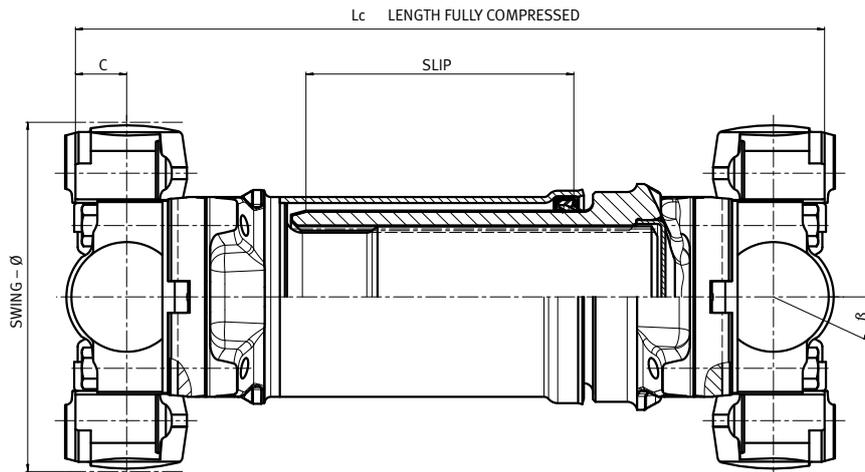
Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle B [°]	Lc [mm]	SLIP [mm]	Lc [mm]	SLIP [mm]
3C	2400	340	96.8	15.5	20	213	37	266	90
						223	47	281	105
						236	60	306	130
						251	75		
4C	3100	430	114.3	15.5	25	tbd	tbd	tbd	tbd
5C	5700	760	121.4	17.5	25	255	45	310	100
						270	60	340	130
						290	80		
6C	7000	885	148.3	17.5	30	264	45	319	100
						279	60	339	120
						304	85	359	140
						286	50	346	110
7C	10500	1425	158.0	20.6	25	306	70	366	130
						326	90	386	150
						329	51	378	100
						346	68	408	130
8C	15300	2120	215.9	20.6	30	363	85	433	155
						351	62	419	130
						369	80	449	160
8.5C	20000	2440	174.8	25.4	25	389	100		
						376	65	456	145
						396	85	496	185
9C	27000	3290	218.9	25.4	25	421	110		
						459	72	542	155
						482	95	582	195
10C	39000	5130	225.6	32.5	25	507	120		

TCs = Functional limit torque – static Torque Capacity – No yielding or plastic deformation up to this torque limit

Td = Continuous operation torque – dynamic Torque – approx. 3000 hours operation at speed 2000 RPM and 3° angle

Short Coupling SC

Driveshaft with length compensation Mechanics®
Synergy short version without tube



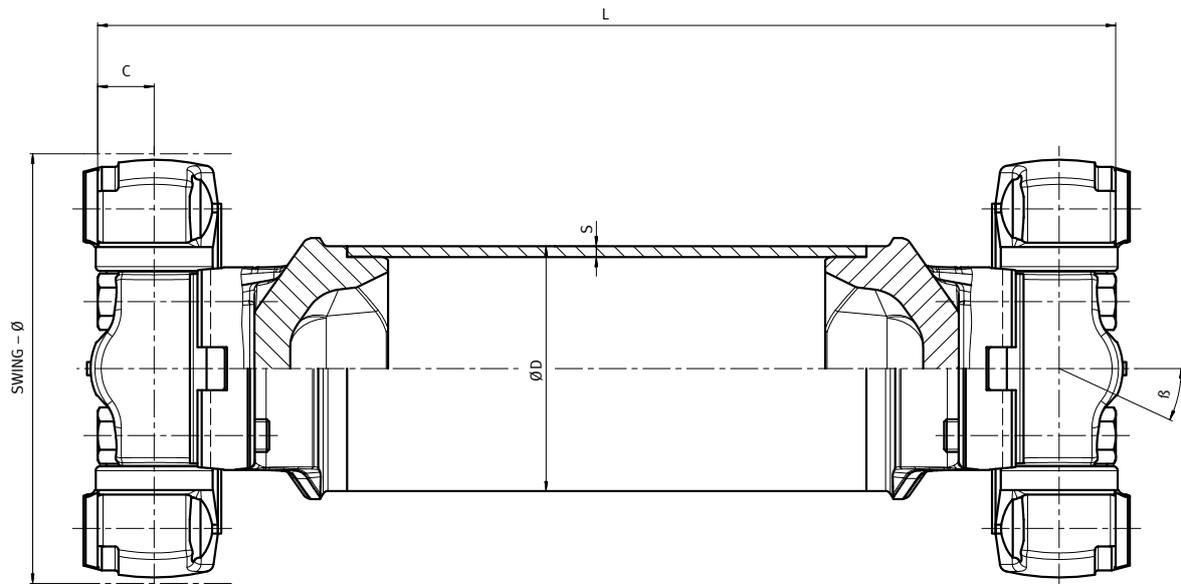
Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle B [°]	Lc [mm]	SLIP [mm]	Lc [mm]	SLIP [mm]
5C	5700	760	121.4	17.5	25	tbd	tbd	tbd	tbd
6C	7000	885	148.3	17.5	25	218	38	250	70
						225	45	265	85
						240	60	280	100
7C	10500	1425	158.0	20.6	25	235	40	278	83
						245	50	291	96
						255	60	305	110
						265	70		
						269	40	314	85
8C	15300	2120	215.9	20.6	30	280	51	329	100
						297	68	359	130
						283	46	330	91
8.5C	20000	2440	174.8	25.4	25	290	53	342	103
						297	58	357	118
						308	69	372	133
						319	80		
						303	49	354	100
9C	27000	3290	218.9	25.4	25	316	62	367	113
						329	75	384	130
						342	88	402	148
						366	53	433	120
10C	39000	5130	225.6	32.5	25	378	65	458	145
						393	80	483	170
						413	100		

TCs = Functional limit torque – static Torque Capacity – No yielding or plastic deformation up to this torque limit

Td = Continuous operation torque – dynamic Torque – approx. 3000 hours operation at speed 2000 RPM and 3° angle

Fixed/Fixed Shaft FF

Driveshaft without length compensation
Mechanics® standard version with tube



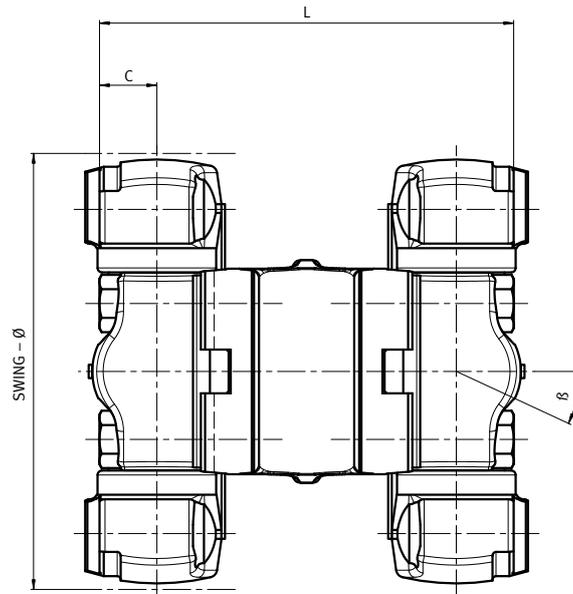
Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle B [°]	TUBE ØD x S [mm]	L min. [mm]
3C	2400	340	96.8	15.5	20	60 x 2	148
4C	3100	430	114.3	15.5	25	63.5 x 2.4	tbd
5C	5700	760	121.4	17.5	25	70 x 3.5	175
6C	7000	885	148.3	17.5	30	80 x 3.5	189
7C	10500	1425	158.0	20.6	25	90 x 4	213
8C	15300	2120	215.9	20.6	30	100 x 4.5	245
8.5C	20000	2440	174.8	25.4	25	100 x 6	249
9C	27000	3290	218.9	25.4	25	115 x 6	265
10C	39000	5130	225.6	32.5	25	130 x 7	347

TCs = Functional limit torque – static Torque Capacity – No yielding or plastic deformation up to this torque limit

Td = Continuous operation torque – dynamic Torque – approx. 3000 hours operation at speed 2000 RPM and 3° angle

Double Joint DJ

Driveshaft without length compensation
Mechanics® short version without tube



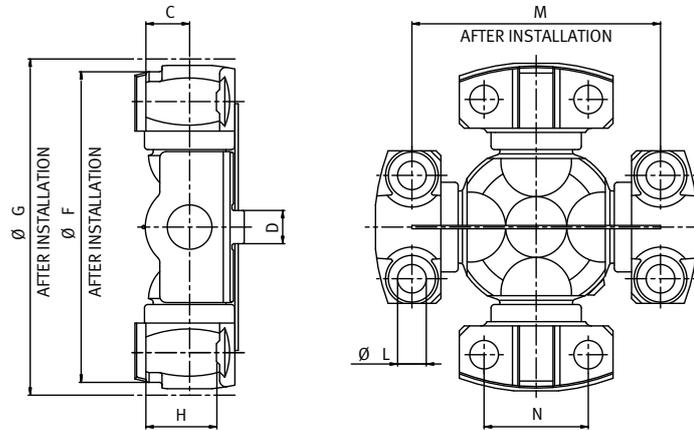
Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle β [°]	L* [mm]
3C	2400	340	96.8	15.5	4	85.8
4C	3100	430	114.3	15.5	7	85.8
5C	5700	760	121.4	17.5	10	104.8
6C	7000	885	148.3	17.5	6	104.8
7C	10500	1425	158.0	20.6	12	127.0
8C	15300	2120	215.9	20.6	12	134.9
8.5C	20000	2440	174.8	25.4	12	152.4
9C	27000	3290	218.9	25.4	10	152.4
10C	39000	5130	225.6	32.5	15	206.3

TCs = Functional limit torque – static Torque Capacity – No yielding or plastic deformation up to this torque limit

Td = Continuous operation torque – dynamic Torque – approx. 3000 hours operation at speed 2000 RPM and 3° angle

* Additional lengths and angles can be provided, consult GKN Engineering for assistance

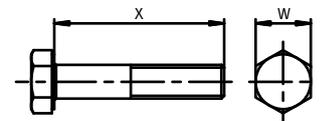
Mechanics® Universal Joints – Dimensions



JOINT SIZE	G [mm]	F [mm]	C [mm]	D [mm]	N [mm]	M [mm]	L [mm]	H [mm]
3C	96.8	90.449	15.5	9.500	36.53	69.85	8.8	25.3
4C	114.3	107.925	15.5	9.500	36.53	87.33	8.8	25.3
5C	121.4	115.062	17.5	14.262	42.88	88.90	10.4 11.1	29.8
6C	148.3	140.462	17.5	14.262	42.88	114.30	10.4 11.1	29.8
7C	158.0	148.387	20.6	15.850	49.23	117.48	13.6	33.6
8C	215.9	206.324	20.6	15.850	49.23	174.63	13.6	33.6
8.5C	174.8	165.075	25.4	15.850	71.42	123.83	13.6	39.9
9C	218.9	209.525	25.4	15.850	71.42	168.28	13.6	39.9
10C	225.6	212.700	32.5	25.375	92.08	165.10	16.7	50.8

Capscrew – Dimensions, Quality and Tightening Torques

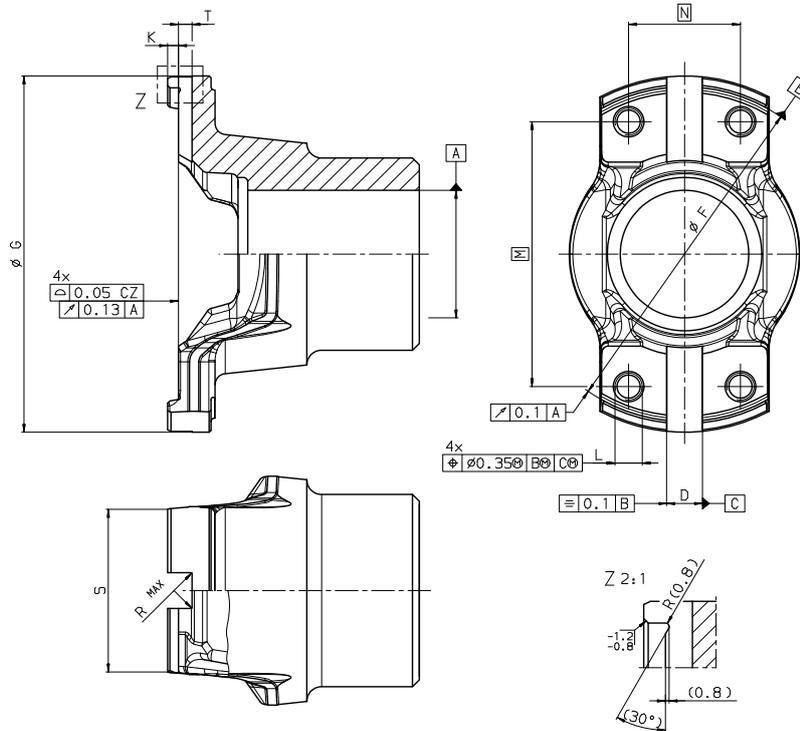
Capscrews must be clean, without the addition of any lubricant, non-coated and free from corrosion prior to assembly.



JOINT SIZE	Metric Type to ISO STD – Quality Class 10.9 / 6g				Inch Type to SAE STD – Quality Grade 8 / 2A			
	Thread size	W [mm]	X [mm]	Tightening torque [Nm]	Thread size	W [mm]	X [mm]	Tightening torque [Nm]
3C	M8x1.25	13	40	30 – 37	5/16"-24 UNF	12.70	38.10	30 – 37
4C								
5C	M10x1.5	16	45	50 – 66	3/8"-24 UNF	14.28	44.45	50 – 66
6C								
7C	M12x1.75	18	55	95 – 108	1/2"-20 UNF	19.05	50.80	95 – 108
8C								
8.5C								
9C	M12x1.75	18	60	129 – 142	1/2"-20 UNF	19.05	57.15	149 – 163
10C								
10C	M16x2	24	80	312 – 325	5/8"-18 UNF	23.81	82.55	312 – 325

Mechanics® Fitting Dimensions

Main dimensions for designing customer specific fitting yokes [mm]



Size	$\emptyset G$	$\emptyset F+0.05$	$D+0.05$	N	M	$K\pm 0.5$	$T\pm 0.25$	R MAX	S $+2.5$ -1.5	L Metric / Inch
3C	96.8 ± 0.25	90.449	9.500	36.53	69.85	3.0	3.81	0.51	52	M8x1.25 5/16"-24UNF
4C	114.3 ± 0.25	107.925	9.500	36.53	87.33	3.0	3.81	0.51	52	M8x1.25 5/16"-24UNF
5C	121.4 ± 0.5	115.062	14.262	42.88	88.90	4.1	5.13	0.51	62	M10x1.5 3/8"-24UNF
6C	148.3 ± 0.5	140.462	14.262	42.88	114.30	4.1	5.13	0.51	62	M10x1.5 3/8"-24UNF
7C	158.0 ± 0.5	148.387	15.850	49.23	117.48	4.8	5.94	0.51	72	M12x1.75 1/2"-20UNF
8C	215.9 ± 0.5	206.324	15.850	49.23	174.63	4.8	5.94	0.51	72	M12x1.75 1/2"-20UNF
8.5C	174.8 ± 0.5	165.075	15.850	71.42	123.83	4.8	5.94	0.51	97	M12x1.75 1/2"-20UNF
9C	218.9 ± 0.5	209.525	15.850	71.42	168.28	4.8	5.94	0.51	97	M12x1.75 1/2"-20UNF
10C	225.6 ± 0.5	212.700	25.375	92.08	165.10	6.4	11.43	2.67	123	M16x2 5/8"-18UNF

Accessories and Special Products

Accessories and Special Products are available and can be manufactured according to specific customer requirements and application. In addition to the standard range of shafts, GKN has the ability to manufacture a wide variety of shafts for many different custom applications. The engineers of GKN work closely with the customer to understand the needs of the application and to develop custom solutions that ensure the optimal performance of the final product.



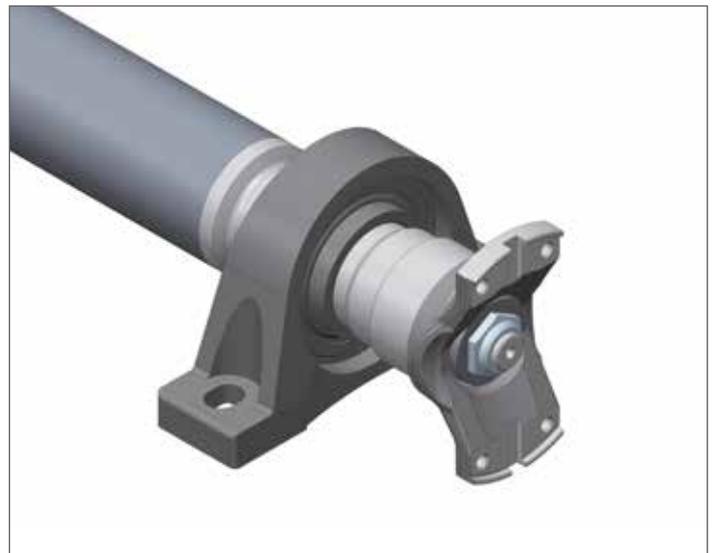
Single joint shaft with flange and length compensation



Fitting Yoke



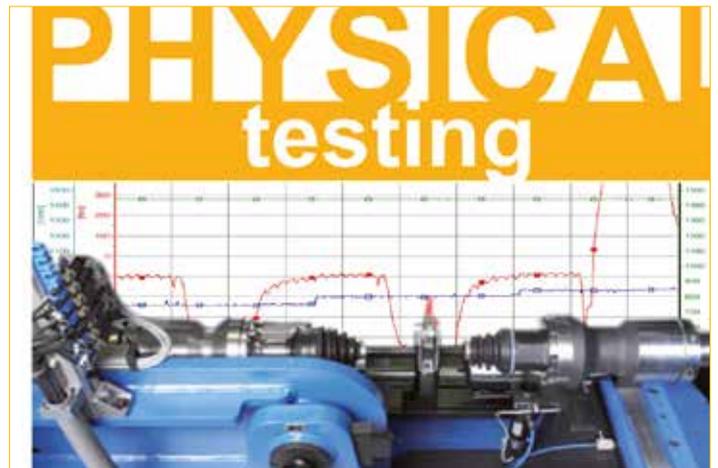
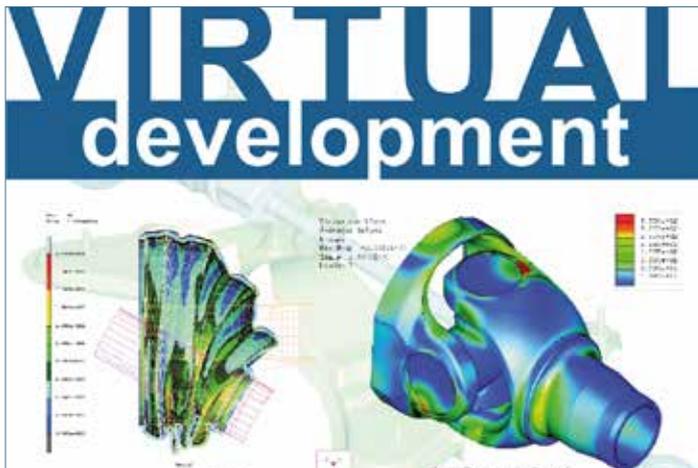
Brake Yoke



Midship Shaft

Engineering/Test Lab Capabilities

GKN offers comprehensive Engineering and Test Lab services to powertrain manufacturers through our R&D facilities. We operate R&D facilities in both Europe and North America, equipped with machining capabilities, test cells, assembly and inspection areas. These facilities can simulate most end-use operating conditions where products must perform. Services include performance testing, endurance testing, destructive testing and environmental testing.



TEST LAB CAPABILITIES:

- > Static Torsion Tests
- > Torsional Fatigue Tests
- > Functional Tests
- > Endurance Tests
- > Environmental Tests (e.g. mud box)
- > High Speed Tests

Test and Development Center Bruneck



Please refer to www.gknoffhighwaypowertrain.com for further information.

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Mechanics® Driveshafts

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Rockford: Driveshafts, Clutches, Service
Woodridge: Driveshafts

Sohland: Gearboxes
Lohmar: Driveshafts, TAS & Hitch
Systems, Service

Tokyo: Driveshafts, Joint Venture

Bruneck:
Driveshafts

Taicang:
Driveshafts,
Service

Cachoeirinha:
Driveshafts

Liuzhou: Driveshafts