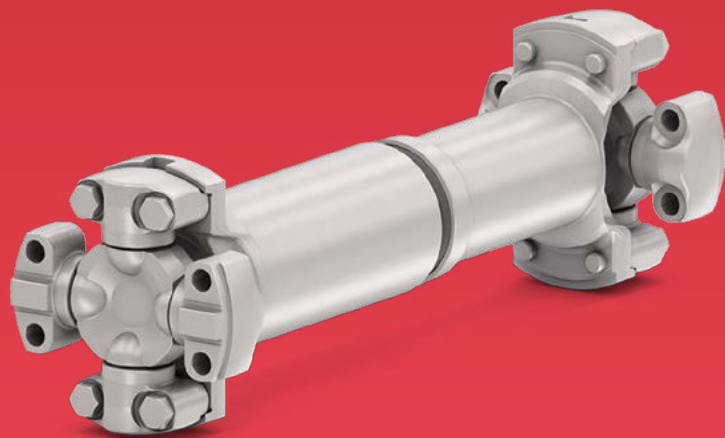




# MECHANICS® SYNERGY DRIVESHAFTS Series 980





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Our products and technology deliver the power to harvest crops, move earth, mine resources and handle material. Increasingly there is a need to focus on energy efficiency, increased productivity and safety as well as enabling operators to be continually connected and well informed to avoid downtime.

The Walterscheid Powertrain Group is committed to providing products and services that support these requirements, and to demonstrating our position in developing technologies and solutions for the challenges of tomorrow, supporting our customers in meeting the demands of a crowded planet.



**The Walterscheid Powertrain Group is a truly global business with 9 manufacturing facilities and 19 service centres in 16 countries across four continents.**

#### **This strong global presence positions us to:**

- ▶ Be well placed to access fast-growing markets
- ▶ Build partnerships with market-leading customers
- ▶ Deliver product and service suited to the local markets
- ▶ Optimise our position in supply chains
- ▶ Develop technologies in partnership with global customers

#### **Key facts**

Number of employees: 2,200

Locations: 9 manufacturing plants and 19 service locations across 16 countries

**The Walterscheid Powertrain Group** – the global supplier of power management products, systems and service solutions for the world's leading off-highway and industrial equipment manufacturers.

#### **Technology and services at the heart of our success**

- ▶ We are continuously developing new technologies and customer solutions which deliver efficiency in the agricultural, construction, mining, utility vehicle and industrial markets
- ▶ We service all powertrain products and systems between power source and power applied



# DRIVESHAFTS PRODUCT RANGE

## CARDAN SHAFTS

Our 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.

Our 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.



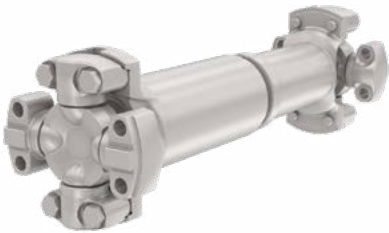
# CARDAN SHAFTS



Cardan Shafts are available in a complete range of sizes for off-highway and industrial applications. We 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, we also have 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 our driveshafts and components, alongside understanding of customers applications, add real value and integrity to the product offering.

With a global manufacturing footprint, we 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 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. Our 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** We offer 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** We offer 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.

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 off-highway technologies from our market-leading Mechanics® Series U-Joints range with inverted slip and shaft design expertise from engineers across the Walterscheid Powertrain group. The 3C-10C range is a natural evolution of existing 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.**

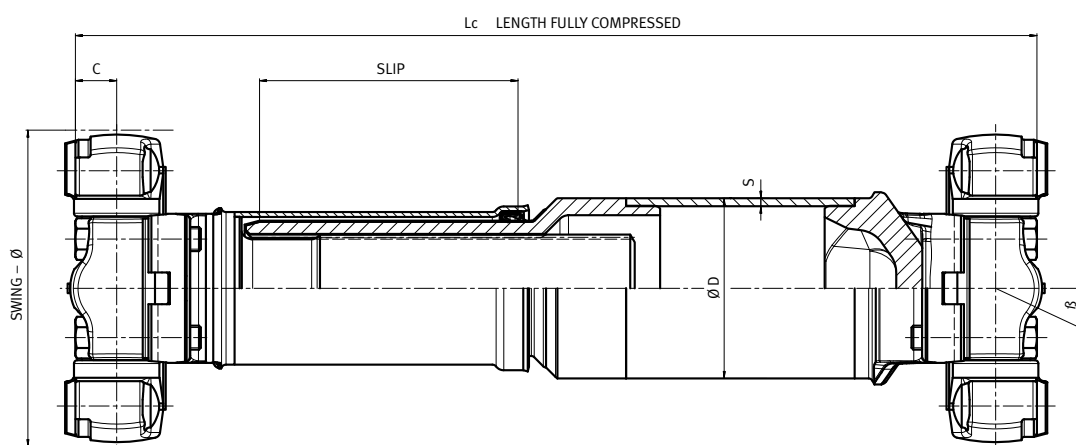
## MECHANICS® SYNERGY

- ▶ 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

Our Driveshaft products are available for supply across Europe, the Americas and Asia.

# Fixed/Slip Shaft **FS** – Series 980 / Design 0.92

Driveshaft with length compensation  
Mechanics® Synergy standard version with tube



Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle B [°]	TUBE ØD x S [mm]	Lc min. [mm]	SLIP [mm]
<b>3C</b> 0.980.03.92.00.000	2400	340	96,8	15,5	20	60 x 2	267	60
							297	90
							337	130
<b>4C</b> 0.980.04.92.00.000	3100	430	114,3	15,5	25	63.5 x 2.4	tbd	70
								90
								130
<b>5C</b> 0.980.05.92.00.000	5700	760	121,4	17,5	25	70 x 3.5	318	80
							348	110
							368	130
<b>6C</b> 0.980.06.92.00.000	7000	885	148,3	17,5	30	80 x 3.5	331	80
							371	120
							396	145
<b>7C</b> 0.980.07.92.00.000	10500	1425	158	20,6	25	90 x 4	360	90
							400	130
							425	155
<b>8C</b> 0.980.08.92.00.000	15300	2120	215,9	20,6	30	100 x 4.5	420	105
							445	130
							470	155
<b>8.5C</b> 0.980.85.92.00.000	20000	2440	174,8	25,4	25	100 x 6	435	100
							465	130
							495	160
<b>9C</b> 0.980.09.92.00.000	27000	3290	218,9	25,4	25	115 x 6	471	110
							511	150
							551	190
<b>10C</b> 0.980.10.92.00.000	39000	5130	225,6	32,5	25	130 x 7	569	110
							609	150
							649	190

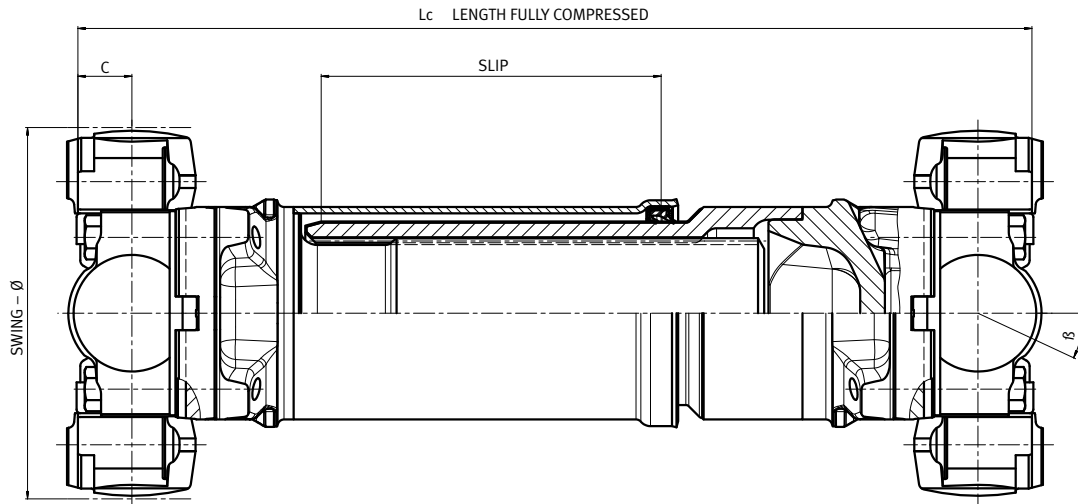
**TCs** = Functional limit torque – static Torque Capacity – No yielding or plastic deformation up to this torque limit

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



# Short Coupled Shaft **SCS** – Series 980 / Design 9.91

Driveshaft with length compensation  
Mechanics® Synergy short version without tube – welded



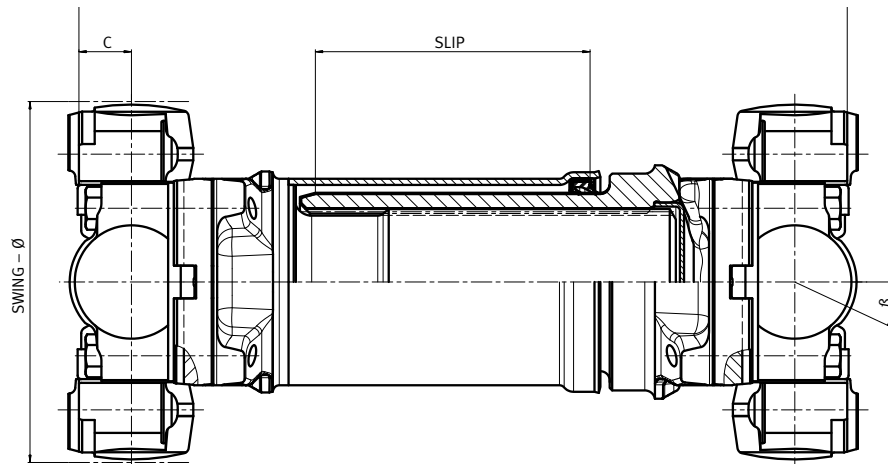
Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle β [°]	Lc [mm]	SLIP [mm]	Lc [mm]	SLIP [mm]
<b>3C</b> 9.980.03.91.00.000	2400	340	96.8	15.5	20	213	37	266	90
						223	47	281	105
						236	60	306	130
						251	75		
<b>4C</b>	3100	430	114.3	15.5	25	tbd	tbd	tbd	tbd
<b>5C</b> 9.980.05.91.00.000	5700	760	121.4	17.5	25	255	45	310	100
						270	60	340	130
						290	80		
<b>6C</b> 9.980.06.91.00.000	7000	885	148.3	17.5	30	264	45	319	100
						279	60	339	120
						304	85	359	140
<b>7C</b> 9.980.07.91.00.000	10500	1425	158.0	20.6	25	286	50	346	110
						306	70	366	130
						326	90	386	150
<b>8C</b> 9.980.08.91.00.000	15300	2120	215.9	20.6	30	329	51	378	100
						346	68	408	130
						363	85	433	155
<b>8.5C</b> 9.980.85.91.00.000	20000	2440	174.8	25.4	25	351	62	419	130
						369	80	449	160
						389	100		
<b>9C</b> 9.980.09.91.00.000	27000	3290	218.9	25.4	25	376	65	456	145
						396	85	496	185
						421	110		
<b>10C</b> 9.980.10.91.00.000	39000	5130	225.6	32.5	25	459	72	542	155
						482	95	582	195
						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 – Series 980 / Design 9.93

Driveshaft with length compensation Mechanics®  
Synergy short version without tube



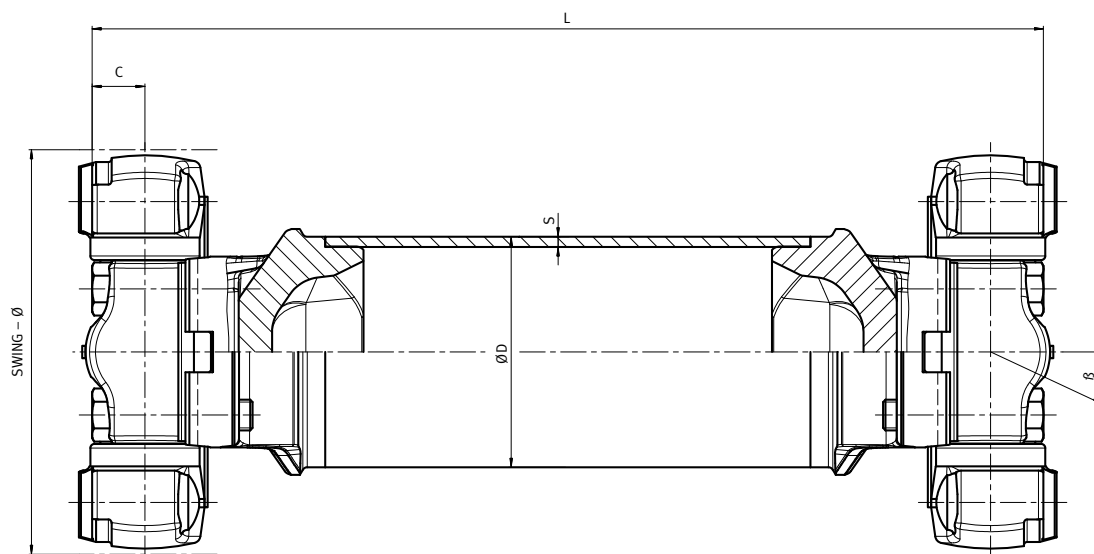
Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle B [°]	Lc [mm]	SLIP [mm]	Lc [mm]	SLIP [mm]
<b>5C</b> 0.980.05.92.00.000	5700	760	121.4	17.5	25	tbd	tbd	tbd	tbd
<b>6C</b> 9.980.06.93.00.000	7000	885	148.3	17.5	25	218	38	250	70
						225	45	265	85
						240	60	280	100
<b>7C</b> 9.980.07.93.00.000	10500	1425	158.0	20.6	25	235	40	278	83
						245	50	291	96
						255	60	305	110
						265	70		
<b>8C</b> 9.980.08.93.00.000	15300	2120	215.9	20.6	30	269	40	314	85
						280	51	329	100
						297	68	359	130
<b>8.5C</b> 9.980.85.93.00.000	20000	2440	174.8	25.4	25	283	46	330	91
						290	53	342	103
						297	58	357	118
						308	69	372	133
						319	80		
<b>9C</b> 9.980.09.93.00.000	27000	3290	218.9	25.4	25	303	49	354	100
						316	62	367	113
						329	75	384	130
						342	88	402	148
<b>10C</b> 9.980.10.93.00.000	39000	5130	225.6	32.5	25	366	53	433	120
						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** - Series 980 / Design 0.93

Driveshaft without length compensation  
Mechanics® standard version with tube



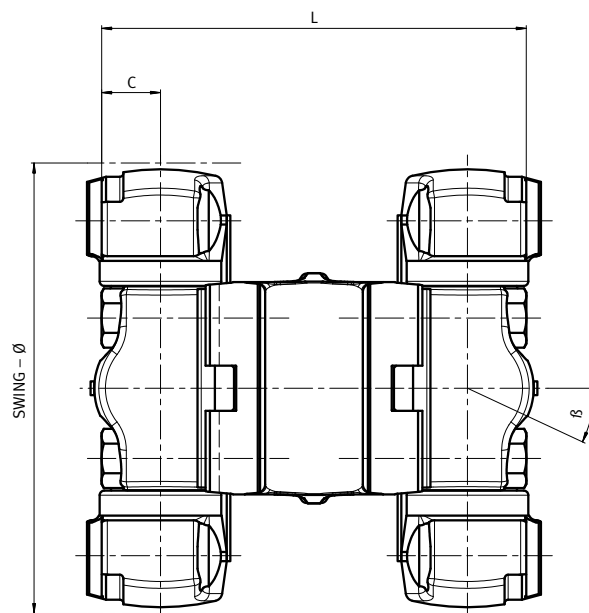
Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle β [°]	TUBE ØD x S [mm]	L min. [mm]
<b>3C</b> 0.980.03.93.00.000	2400	340	96.8	15.5	20	60 x 2	148
<b>4C</b> 0.980.04.93.00.000	3100	430	114.3	15.5	25	63.5 x 2.4	tbd
<b>5C</b> 0.980.05.93.00.000	5700	760	121.4	17.5	25	70 x 3.5	175
<b>6C</b> 0.980.06.93.00.000	7000	885	148.3	17.5	30	80 x 3.5	189
<b>7C</b> 0.980.07.93.00.000	10500	1425	158.0	20.6	25	90 x 4	213
<b>8C</b> 0.980.08.93.00.000	15300	2120	215.9	20.6	30	100 x 4.5	245
<b>8.5C</b> 0.980.85.93.00.000	20000	2440	174.8	25.4	25	100 x 6	249
<b>9C</b> 0.980.09.93.00.000	27000	3290	218.9	25.4	25	115 x 6	265
<b>10C</b> 0.980.10.93.00.000	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** – Series 980 / Design 9.95

Driveshaft without length compensation  
Mechanics® short version without tube

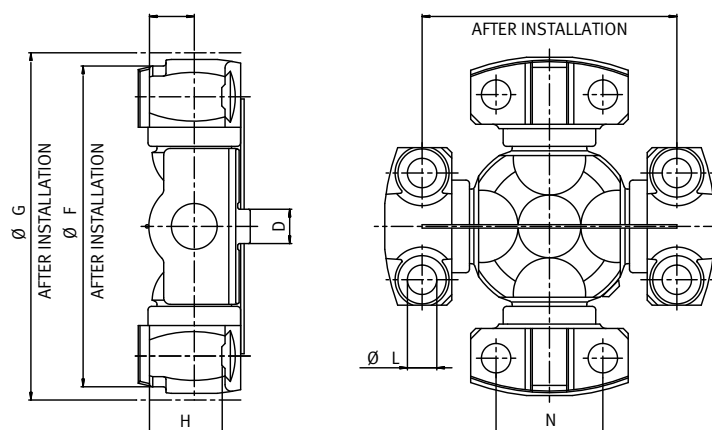


Size	TCs [Nm]	Td [Nm]	SWING-Ø [mm]	C [mm]	Angle β [°]	L* [mm]
<b>3C</b> 9.980.03.95.00.000	2400	340	96.8	15.5	4	85.8
<b>4C</b> 9.980.04.95.00.000	3100	430	114.3	15.5	7	85.8
<b>5C</b> 9.980.05.95.00.000	5700	760	121.4	17.5	10	104.8
<b>6C</b> 9.980.06.95.00.000	7000	885	148.3	17.5	6	104.8
<b>7C</b> 9.980.07.95.00.000	10500	1425	158.0	20.6	12	127.0
<b>8C</b> 9.980.08.95.00.000	15300	2120	215.9	20.6	12	134.9
<b>8.5C</b> 9.980.85.95.00.000	20000	2440	174.8	25.4	12	152.4
<b>9C</b> 9.980.09.95.00.000	27000	3290	218.9	25.4	10	152.4
<b>10C</b> 9.980.10.95.00.000	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 Walterscheid Powertrain Group Engineering for assistance

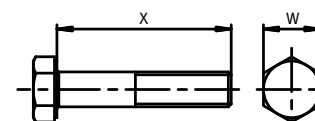


JOINT SIZE	G [mm]	F [mm]	C [mm]	D [mm]	N [mm]	M [mm]	L [mm]	H [mm]
3C (4056766)	96.8	90.449	15.5	9.500	36.53	69.85	8.8	25.3
4C (4056767)	114.3	107.925	15.5	9.500	36.53	87.33	8.8	25.3
5C (4083100)	121.4	115.062	17.5	14.262	42.88	88.90	10.4 11.1	29.8
6C (4083102)	148.3	140.462	17.5	14.262	42.88	114.30	10.4 11.1	29.8
7C (4083104)	158.0	148.387	20.6	15.850	49.23	117.48	13.6	33.6
8C (4083106)	215.9	206.324	20.6	15.850	49.23	174.63	13.6	33.6
8.5C (4083108)	174.8	165.075	25.4	15.850	71.42	123.83	13.6	39.9
9C (4083110)	218.9	209.525	25.4	15.850	71.42	168.28	13.6	39.9
10C (4083134)	225.6	212.700	32.5	25.375	92.08	165.10	16.7	50.8

In brackets parts numbers for regreaseable U-Joints. (Lube for life are available)

## 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.

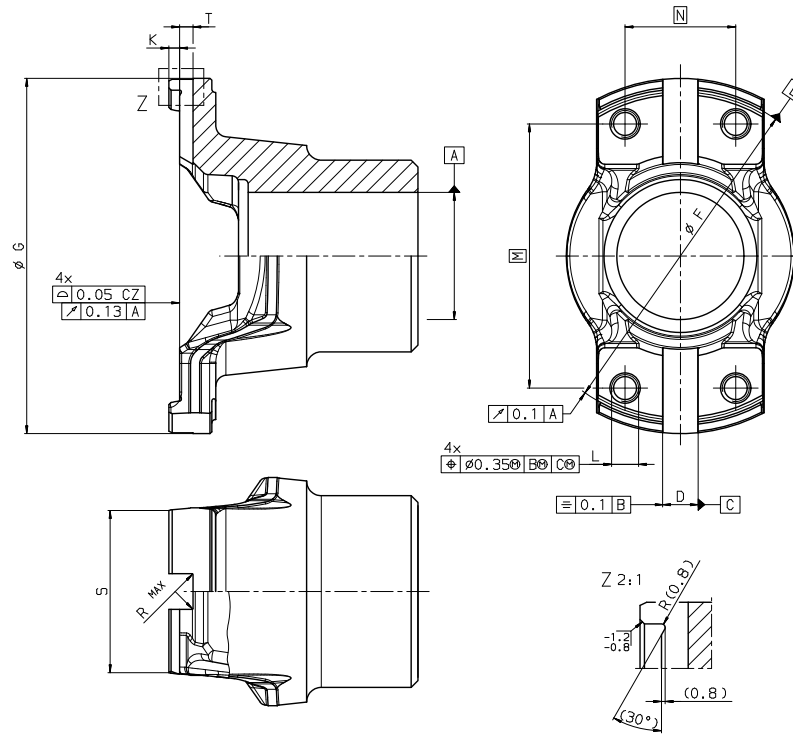


JOINT SIZE	Metric Type to ISO STD – Quality Class 10.9 / 6g				Inch Type to SAE STD – Quality Grade 8 / 2A				
	Thread size	W [mm]	X [mm]	Tightening torque [Nm]	Thread size	W [mm]	X [mm]	Tightening torque [Nm]	
3C	M8x1.25	13	40	30 – 37	5/16"-24 UNF	12.70	38.10	30 – 37	
4C									
5C	M10x1.5	16	45	50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



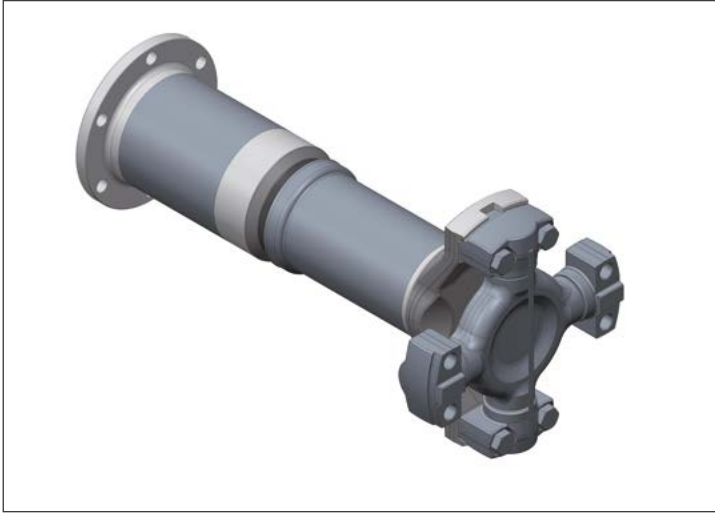
# Mechanics® Fitting Dimensions

Main dimensions for designing customer specific fitting yokes [mm]

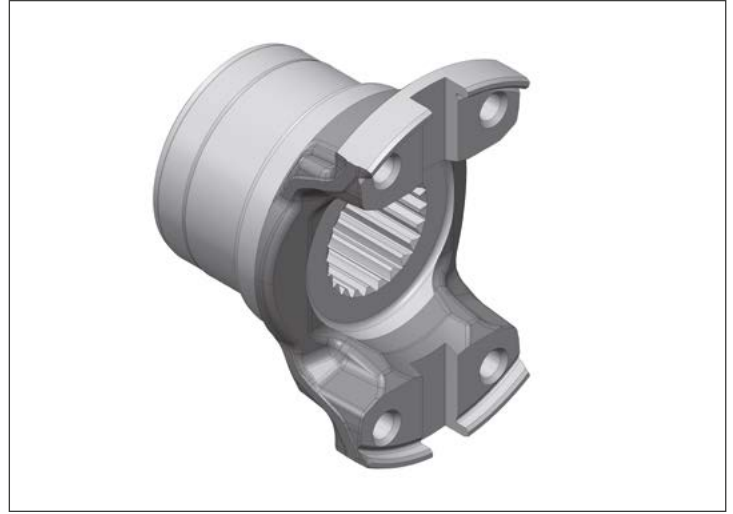


Size	Ø G	Ø F +0.05	D +0.05	N	M	K ±0.5	T ±0.25	R MAX	S +2.5 -1.5	L Metric / Inch
3C	96.8 ±0.25	90.449	9.500	36.53	69.85	3.0	3.81	0.51	52	M8x1.25 5/16"-24UNF
4C	114.3 ±0.25	107.925	9.500	36.53	87.33	3.0	3.81	0.51	52	M8x1.25 5/16"-24UNF
5C	121.4 ±0.5	115.062	14.262	42.88	88.90	4.1	5.13	0.51	62	M10x1.5 3/8"-24UNF
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 are available and can be manufactured according to specific customer requirements and application. In addition to the standard range of shafts, Walterscheid Powertrain Group has the ability to manufacture a wide variety of shafts for many different custom applications. The engineers of Walterscheid Powertrain Group 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.



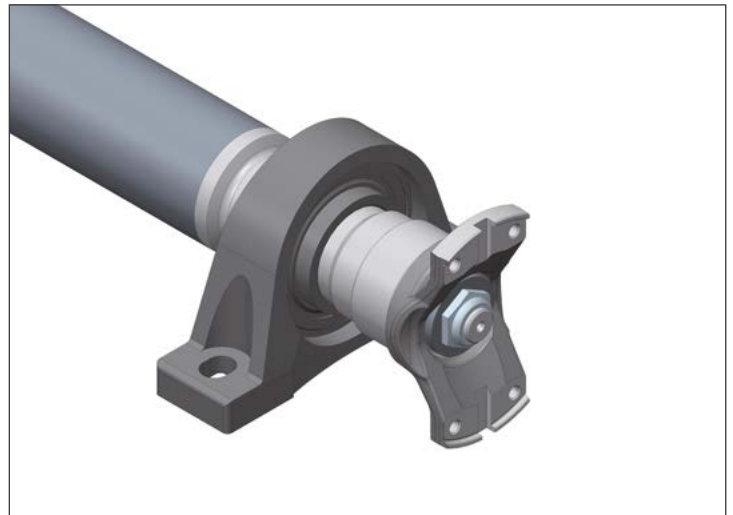
Single joint shaft with flange and length compensation



Fitting Yoke



Brake Yoke



Midship Shaft