

HIGH PERFORMANCE UNIVERSAL DRIVESHAFTS



- Torque capacity upto 270,000 Nm
- Long Slip Movement versions
- Wide Angle versions upto 35°
- Flange sizes upto \varnothing 435 mm
- Shafts upto 5000mm long
- DIN & SAE Flange fittings
- Quick release versions
- Multiple Shaft Systems
- Companion Flanges
- Flexible Couplings
- Mechanics Joints
- Universal Joints
- Double Joints
- Jack Shafts

NDE

CLARKE
TRANSMISSIONS LTD

NDE Clarke Transmissions Ltd - Company Profile



NDE Clarke Transmissions manufacture high quality Driveshafts and drivelines to most configurations and specifications with either S.A.E. or D.I.N. standard Flanges for European and U.K. built equipment - including industrial applications.

NDE Clarke brings to the Driveshafts market a dynamic commercial approach, complementing substantial driveline skills, thereby producing a Cardan Shaft manufacturer which offers you the package of quality, price and service necessary to your business.

This technical manual defines our current standard programme and provides the technical information to assist the Design Engineer in the selection and layout of drivelines. It has not been possible to include a very wide range of special designs which we undertake within the contents of this manual. We would be pleased if you would contact our Technical Sales Department now for prompt technical assistance and pricing. NDE Clarke will offer you a complete engineering solution.

Quality through
Investment



Registered No. FM 28213

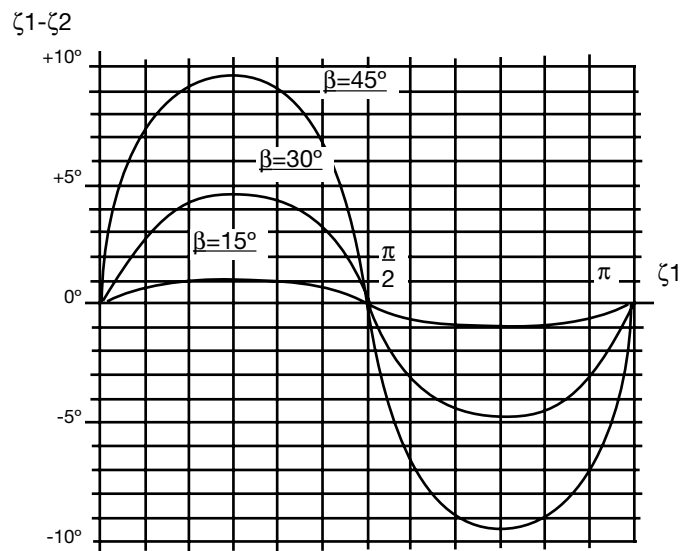


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Universal Joint Theory

The Universal Joint also known as the Cardan or Hooke's Joint consists of a Journal (or spider) and four Bearings. Its purpose is to transmit torque from one inclined Shaft to another and the use of this construction can be traced back more than 700 years.

The uniform rotation ω_1 of a single Universal Joint deflected at a certain angle β will result in a non-uniform rotation of the output side of the Joint.



The non-constant velocity can be compensated by a second Joint provided that they are both in phase.

i.e. The Yokes (1) of the intermediate Shafts must be situated in the same plane. Marking arrows (2) must be noted.

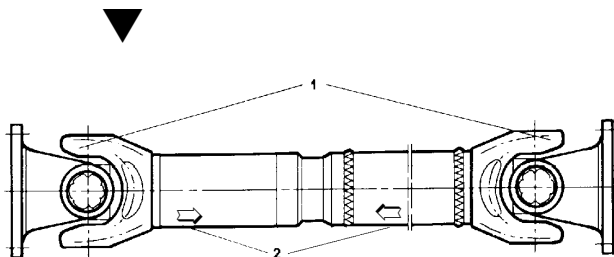
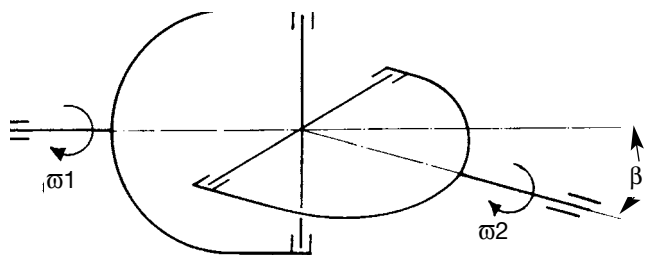


Diagram 1.

Shaft 1

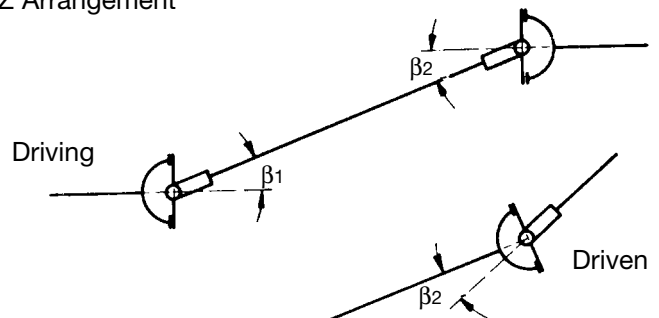


Shaft 2

This irregularity is called Cardan error and results in a sine like oscillation of the angular velocity ω_2 and a phase difference of Shaft 2 rotation angle ζ with the amplitude of plus or minus $\zeta_1 - \zeta_2$.

Diagram 2.

Z Arrangement

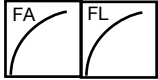







W Arrangement

The Joint angles β_1 and β_2 must be equal. Two common methods of achieving this are the W and Z arrangements.

How to select a Driveshaft

Selection of the correct Universal Driveshaft for an application is dependent on the service life required, this is based on the following criteria.

<p>Step 1</p>	<p>Calculate torque using formula.</p>	$T = \frac{9545 \times P}{n} \text{ (Nm)}$ <p style="text-align: right;">Page 3</p>
<p>Step 2</p>	<p>Use life and angle requirements in conjunction with diagrams to determine Angle Factor (FA) and Life Factor (FL).</p>	 <p style="text-align: right;">Page 3</p>
<p>Step 3</p>	<p>Using formula determine corrected torque and make provisional selection using diagram.</p>	$TC = T \times FA \times FL \text{ (Nm)}$  <p style="text-align: right;">Page 4</p>
<p>Step 4</p>	<p>Using table determine the service factor K which is dependent upon application.</p>	<p>e.g. Service Factor K Paper machines 2</p> <p style="text-align: right;">Page 5</p>
<p>Step 5</p>	<p>Using formula determine maximum torque.</p>	$T_{max} = T \times K \text{ (Nm)}$ <p style="text-align: right;">Page 5</p>
<p>Step 6</p>	<p>Using the range data tables on pages 9-26, check T_{max} does not exceed the short duration torque (Tsd) for the selected series of Driveshaft.</p>	 <p style="text-align: right;">Page 9 to 26</p>
<p>Step 7</p>	<p>Check angle to speed relationship for the series selected as shown on diagram. Angle and speed must intersect below the series line.</p>	 <p style="text-align: right;">Page 6</p>
<p>Step 8</p>	<p>Check to ensure that the working angle does not exceed maximum stated angle for the series selected using the range data tables (note: compound angles must be calculated using formula). Again the resultant angle must not exceed the maximum angle stated.</p>	 $\tan \beta = \sqrt{\tan^2 \beta_H + \tan^2 \beta_V}$ <p style="text-align: right;">Page 6</p>
<p>Step 9</p>	<p>Check critical speed of the selected series does not exceed that in diagram. For Driveshafts with non-standard Tube dimensions, determine critical speed using formula.</p>	 $n(\text{crit}) = 1.22 \times 10^7 \times \frac{\sqrt{D^2 + d^2}}{L^2} \text{ (r.p.m.)}$ <p style="text-align: right;">Page 7</p>

Driveshaft Selection

Selection of the correct Driveshaft for an application is dependent on the service life required which is based on the following criteria.

- 1) Torque
- 2) Joint Angles
- 3) Joint Life
- 4) Application Data; e.g. Shocks, Vibration, Cycle
- 5) Critical Speed

TORQUE

Torque is calculated using formula:

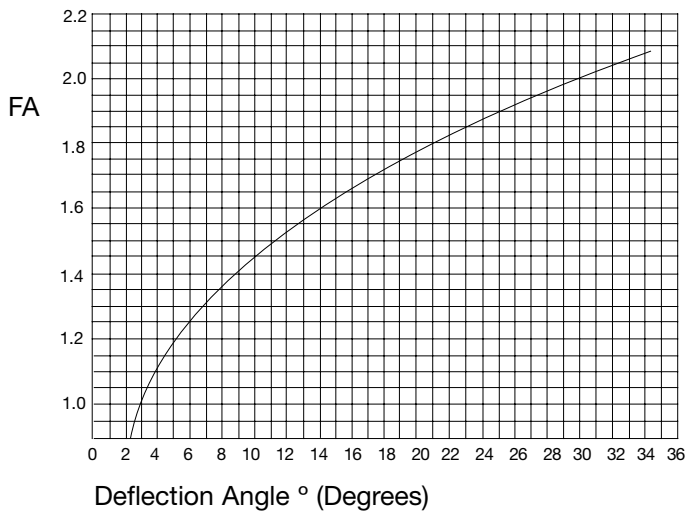
$$T = \frac{9545 \times P \text{ (Nm)}}{n}$$

Where

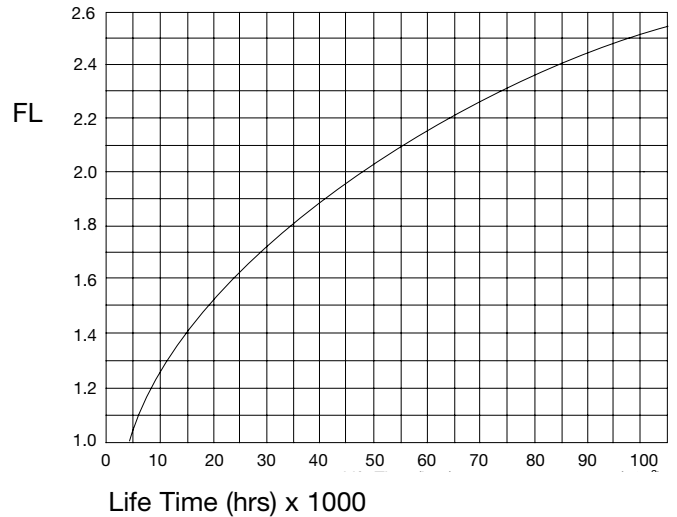
T = Torque in Nm
P = Power in kW (1 hp = 0.7457 kW)
n = Speed in rpm

ANGLE AND LIFE FACTOR

Angle Factor



Life Factor



CORRECTED TORQUE

Corrected torque is calculated using formula:

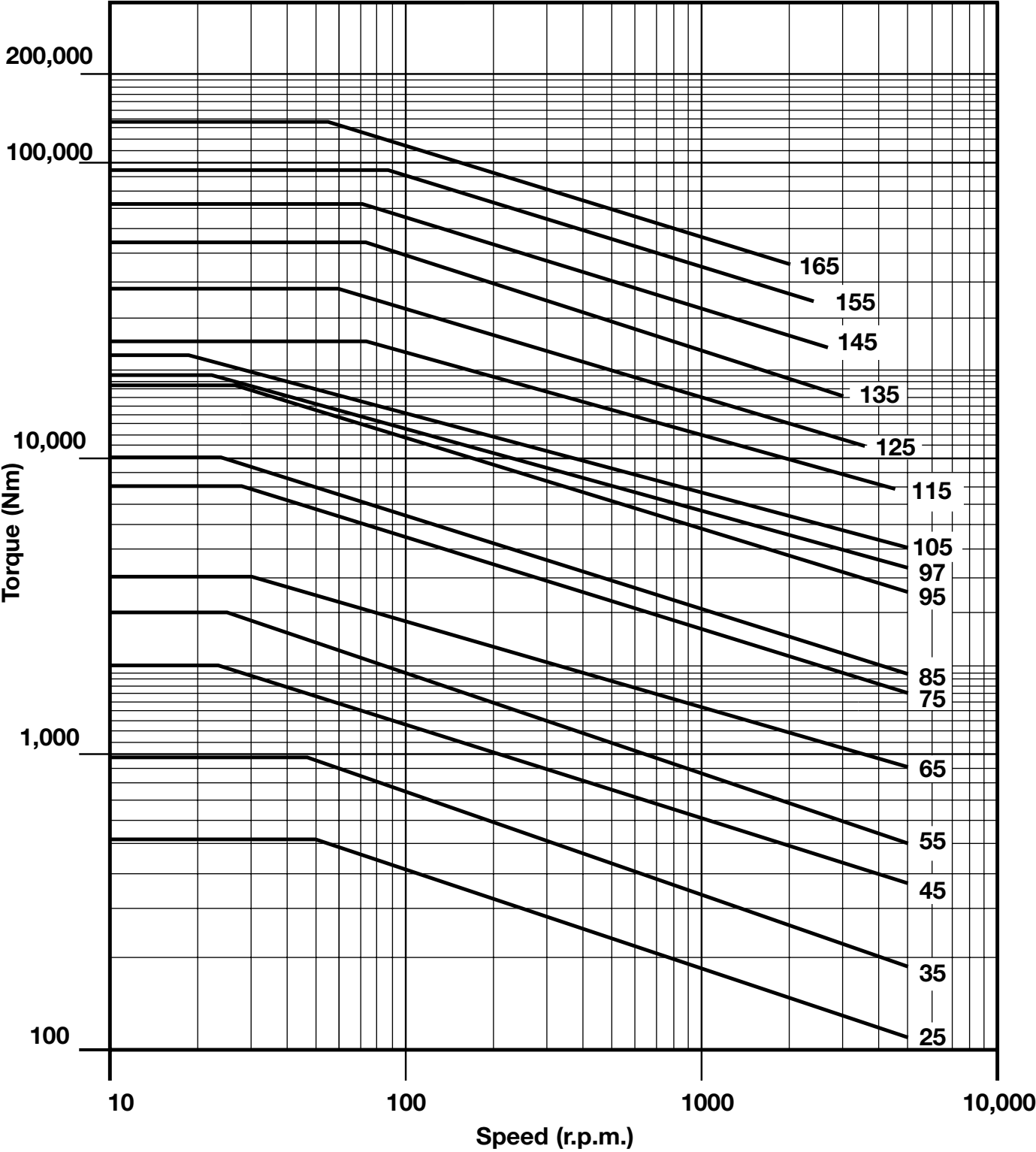
$$TC = T \times FA \times FL \text{ (Nm)}$$

Where

TC = Corrected torque
T = Torque
FA = Angle factor
FL = Life Factor

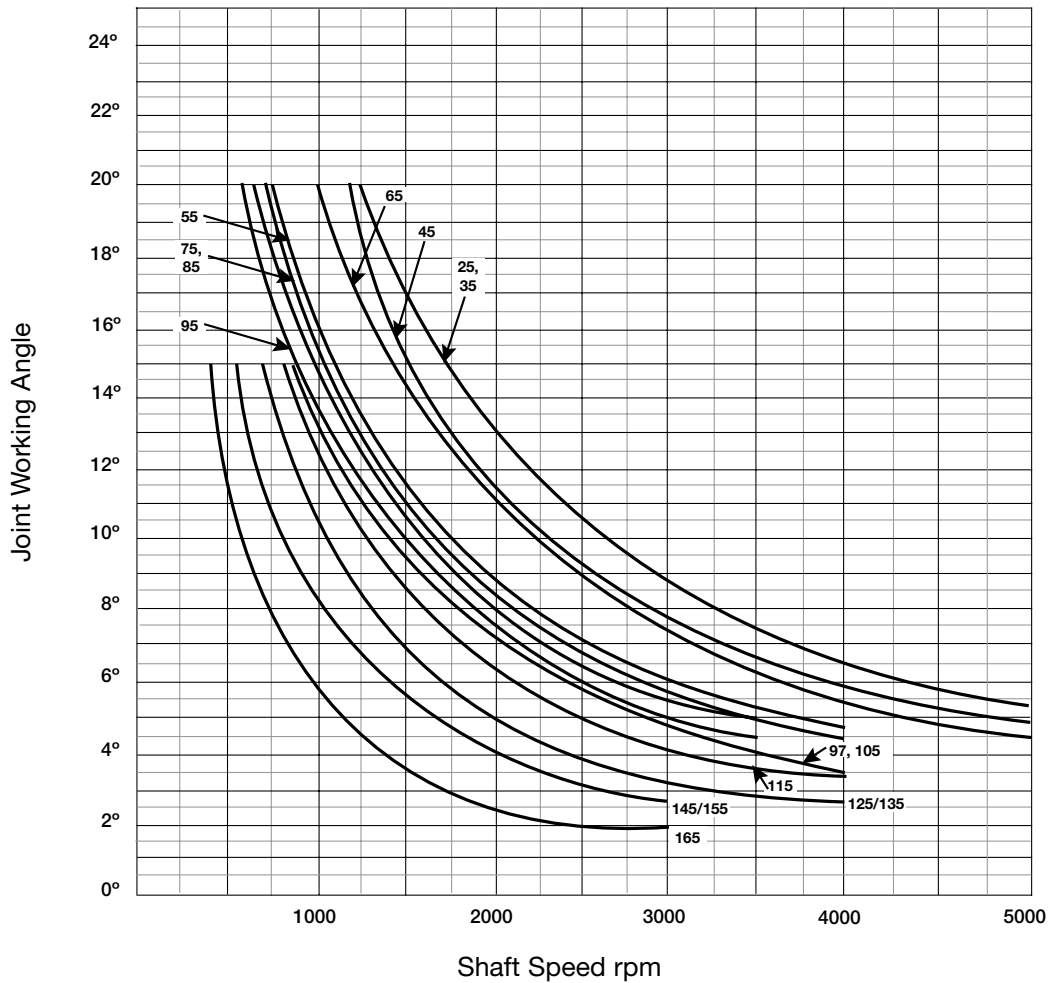
PROVISIONAL SELECTION

Standard Joint life calculation graph based on operation for 5000 hours at 3°.



ANGLE TO SPEED RELATIONSHIP

Angle and speed are governed by a relationship for each Joint size as shown below. Angle and speed must intersect below the series line.



Angles are also governed by the maximum working angles as listed in the catalogue for each series - Flange combination.

COMPOUND ANGLES

To determine the compound Joint angle when a Driveshaft is deflected in the two planes (V vertical, H horizontal).

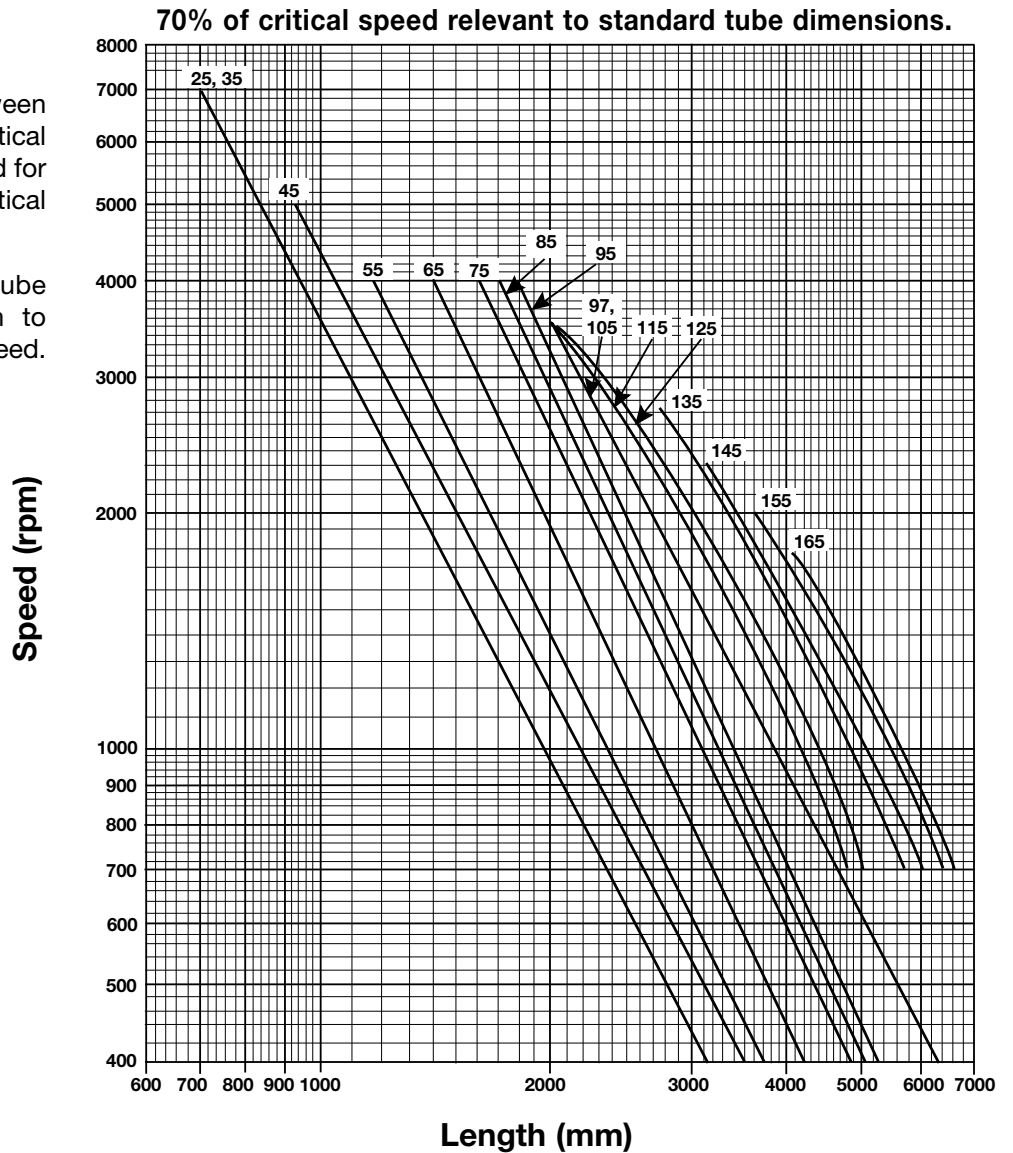
The compound Joint angle is calculated using formula: $\tan \beta = \sqrt{\tan^2 \beta_H + \tan^2 \beta_V}$

Where β_H = Working angle horizontal plane
 β_V = Working angle vertical plane

CRITICAL SPEED

Another relationship is that between speed and length, referred to as critical speed. The maximum working speed for safety reasons is taken at 70% of critical speed relevant to tube dimensions.

For Driveshafts with **standard** tube dimensions use the graph shown to determine the maximum working speed.



For Driveshafts with **non-standard** tube dimensions

critical speed is calculated using formula :

$$n(\text{crit.}) = 1.22 \times 10^7 \times \frac{\sqrt{D^2 + d^2}}{L^2} \text{ (rpm)}$$

Where

- n = Critical speed in rpm
- D = Tube outside diameter (cm)
- d = Tube inside diameter (cm)
- L = Length of Driveshaft (cm)

Again the maximum working speed should be limited to 70% of the calculated critical speed.

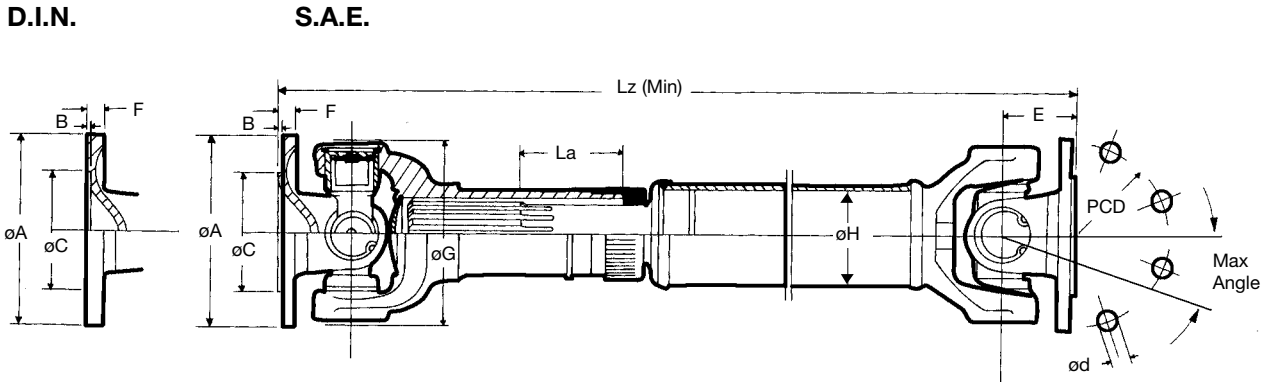
CRITICAL LENGTH

Critical length can be calculated using formula :

$$L(\text{crit.}) = \frac{\sqrt{1.22 \times 10^7 \times \sqrt{D^2 + d^2}}}{n} \text{ (cm)}$$

Range and Designation

Range	Size	Torque Rating (Nm)	Flange Sizes Available		Types Available	Dimensions Page
			SAE	DIN		
Light Duty	25	570	1140	90	A, Y, M	9 to 11
	35	990	1310	100		
	45	2050	1410	120		
	55	3120	1510	150		
Medium Duty	65	4000	1510	120	A, Y, M, B	12 to 15
	75	8000	1600	150		
			1700	165		
			1800	180		
	85	10000	1800	150		
				180		
	95	17500	1800	180		
	97	19000	1900	225		
			250			
Heavy Duty	105	18000		225	A, Y, B	16 to 18
	115	25000		250		
	125	37000		285		
	135	52000		315		
	145	72000		350		
	155	94000		390		
	165	136000		435		
Heavy Duty With Dowel Pins	106	33000		225	A, Y,	19 to 20
	116	40000		250		
	126	47000		285		
	136	70000		315		
	146	102000		350		
	156	145000		390		
Heavy Duty With Face Key	107	44000		225	A, Y	21 to 22
	117	64000		250		
	127	98000		285		
	137	140000		315		
	147	190000		350		
	157	260000		390		



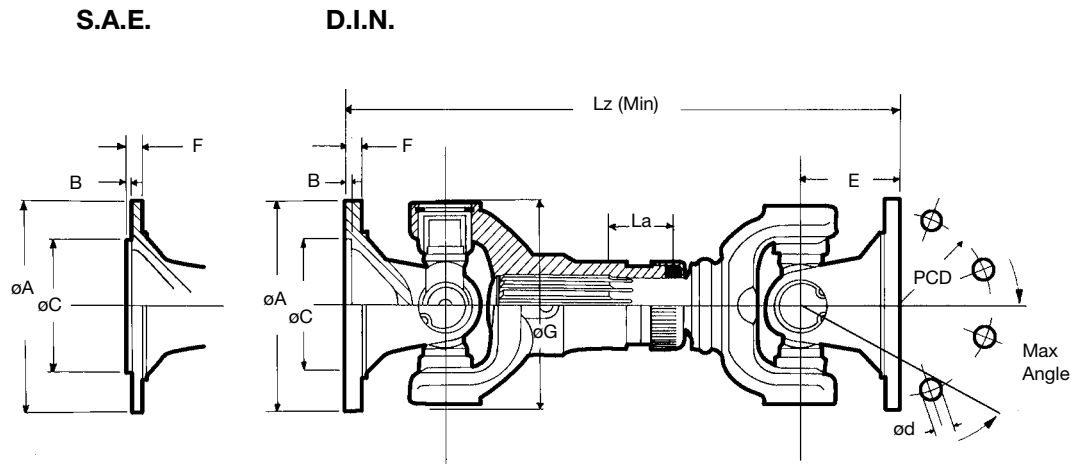
Telescopic Driveshafts (Shaft Type A)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	ϕA	B	ϕC	PCD	No. / ϕd	E	F	ϕG	ϕH	Lz (Min.)	La (Ext.)	WEIGHT (Lz Min.)
SAE IMPERIAL FLANGE FITTINGS															
570	25	25A060648	20°	87.3	1.6	57.15	69.85	4 / 8	30.2	5.2	76.2	50.8	290	42.9	3.5
990	35	35A040448	20°	96.8	1.6	60.325	79.38	4 / 9.5	35	6.7	97	50.8	350	50.8	4.5
		35A040425	20°	96.8	1.6	60.325	79.38	4 / 9.5	35	6.7	97	63.5	350	50.8	5
2050	45	45A080827	20°	115	1.6	69.85	95.25	4 / 11.1	42.9	7.6	122	76.2	405	57	7.4
3120	55	55A515127	20°	146	1.6	95.25	120.65	4 / 12.7	63.5	9.1	136	76.2	475	60	13.9
DIN METRIC FLANGE FITTINGS															
570	25	25A292948	20°	90	2.6	47	74.5	4 / 8	40	6	76.2	50.8	310	42.9	3.5
990	35	35A050548	20°	100	2.6	57	84	6 / 8	48	7	97	50.8	376	50.8	4.5
		35A050525	20°	100	2.6	57	84	6 / 8	48	7	97	63.5	376	50.8	5
2050	45	45A111127	20°	120	2.6	75	101.5	8 / 8	56	8	122	76.2	431	57	7.4
		45A121227	20°	120	2.6	75	101.5	8 / 10	56	8	122	76.2	431	57	7.4
3120	55	55A535327	20°	120	2.6	75	101.5	8 / 10	75	8	136	76.2	498	60	13.9
		55A545427	20°	150	2.6	90	130	8 / 12	86	10	136	76.2	520	60	13.9

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms
 Holes in SAE Flanges are not equi-spaced



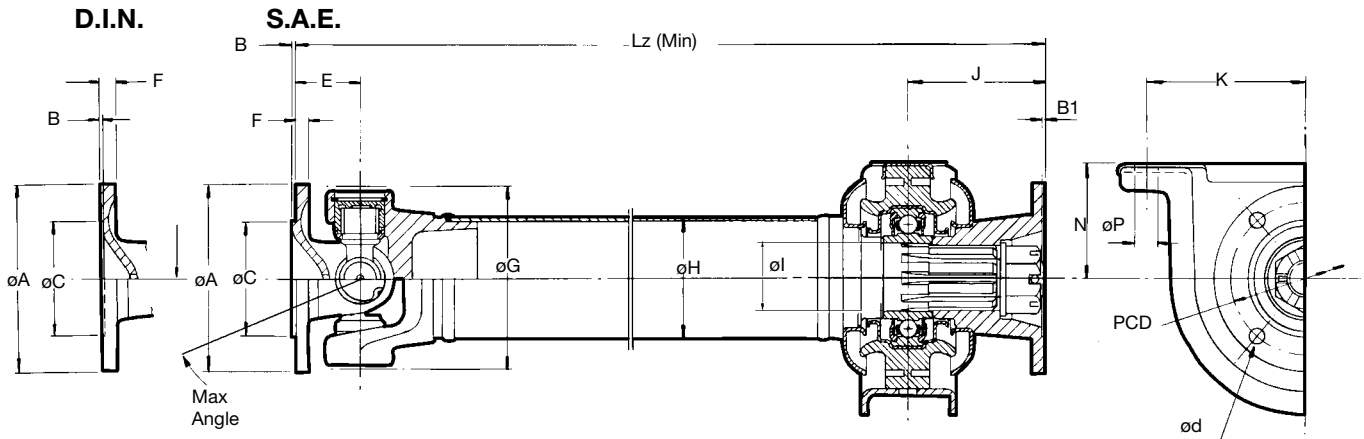
Short Coupled Driveshafts (Shaft Type Y)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	E	F	øG	Lz (Min.)	La (Ext.)	WEIGHT Lz (Min.)
SAE IMPERIAL FLANGE FITTINGS														
570	25	25Y060600	20°	87.3	1.6	57.15	69.85	4 / 8	30.2	5.2	76.2	178 - 235	19 - 43	3.2
990	35	35Y040400	20°	96.8	1.6	60.325	79.38	4 / 9.5	35	6.7	97	225 - 300	20 - 50	4.1
2050	45	45Y080800	20°	115	1.6	69.85	95.25	4 / 11.1	42.9	7.6	122	240 - 365	20 - 57	7.5
3120	55	55Y515100	20°	146	1.6	92.25	120.65	4 / 12.7	63.5	9.1	136	348 - 445	32 - 60	13.3
DIN METRIC FLANGE FITTINGS														
570	25	25Y292900	20°	90	2.6	47	74.5	4 / 8	40	6	76.2	198 - 255	19 - 43	3.2
990	35	35Y050500	20°	100	2.6	57	84	6 / 8	48	7	97	251 - 326	20 - 50	4.1
2050	45	45Y121200	20°	120	2.6	75	101.5	8 / 10	56	8	122	266 - 391	20 - 57	7.5
3120	55	55Y545400	20°	150	2.6	90	130	8 / 12	86	10	136	393 - 490	32 - 60	13.3

NOTE:
 The above Driveshafts are standard assemblies. Shorter Coupled Driveshafts can be manufactured using special parts. Contact our Technical Sales Department for more information.

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms
 Holes in SAE Flanges are not equi-spaced



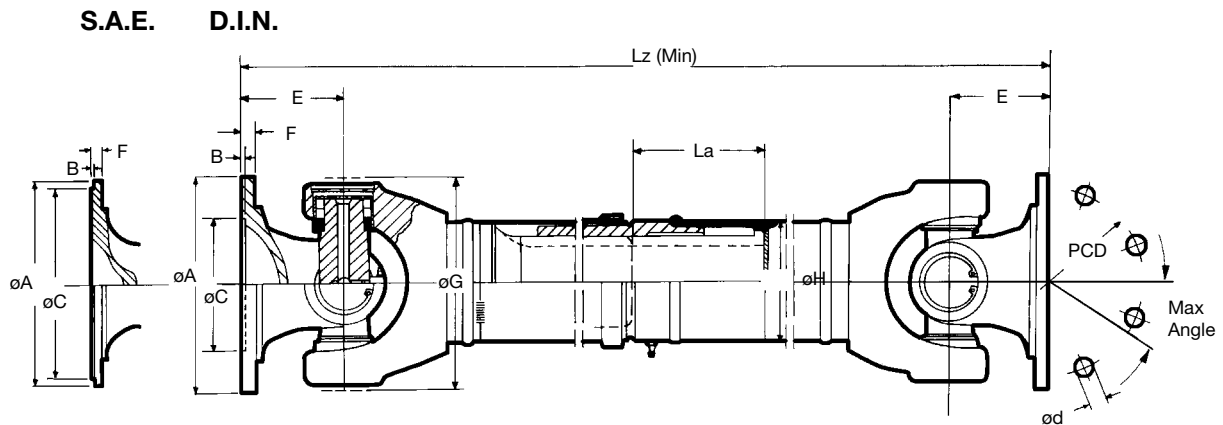
Midship Driveshafts (Shaft Type M)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	B1	øC	PCD	No. / ød	E	F	øG	øH	øI	J	K	øP	N	Lz (Min.)	WEIGHT Lz (Min.)
SAE IMPERIAL FLANGE FITTINGS BOTH ENDS																				
990	35	35M040448	20°	96.8	1.6	1.9	60.325	79.38	4 / 9.5	35	6.7	97	50.8	35	73.2	84.1	12.7	57.9	275	4.9
		35M040425	20°	96.8	1.6	1.9	60.325	79.38	4 / 9.5	35	6.7	97	63.5	35	73.2	84.1	12.7	57.9	275	5.4
2050	45	45M080827	20°	115	1.6	2.3	69.85	95.25	4 / 11.1	42.9	7.6	122	76.2	40	82.6	84.1	12.7	62.7	300	7.8
3120	55	55M515127	20°	146	2	3.3	95.25	120.65	4 / 12.7	64	9.1	136	76	40	83	84	12.7	63	335	14.3
DIN METRIC FLANGE FITTING WITH SAE FLANGE FITTING AT BEARING END																				
990	35	35M050448	20°	100	2.6	1.9	57	84	6 / 8	48	7	97	50.8	35	73.2	84.1	12.7	57.9	288	4.9
		35M050425	20°	100	2.6	1.9	57	84	6 / 8	48	7	97	63.5	35	73.2	84.1	12.7	57.9	288	5.4
2050	45	45M110827	20°	120	2.6	2.3	75	101.5	8 / 8	56	8	122	76.2	40	82.6	84.1	12.7	62.7	313	7.8
		45M120827	20°	120	2.6	2.3	75	101.5	8 / 10	56	8	122	76.2	40	82.6	84.1	12.7	62.7	313	7.8
3120	55	55M535127	20°	120	3	3.3	75	101.5	8 / 10	75	8	136	76	40	83	84	12.7	63	335	14.3
		55M545127	20°	150	3	3.3	90	130	8 / 12	86	10	136	76	40	83	84	12.7	63	335	14.3

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Minimum Fixed length

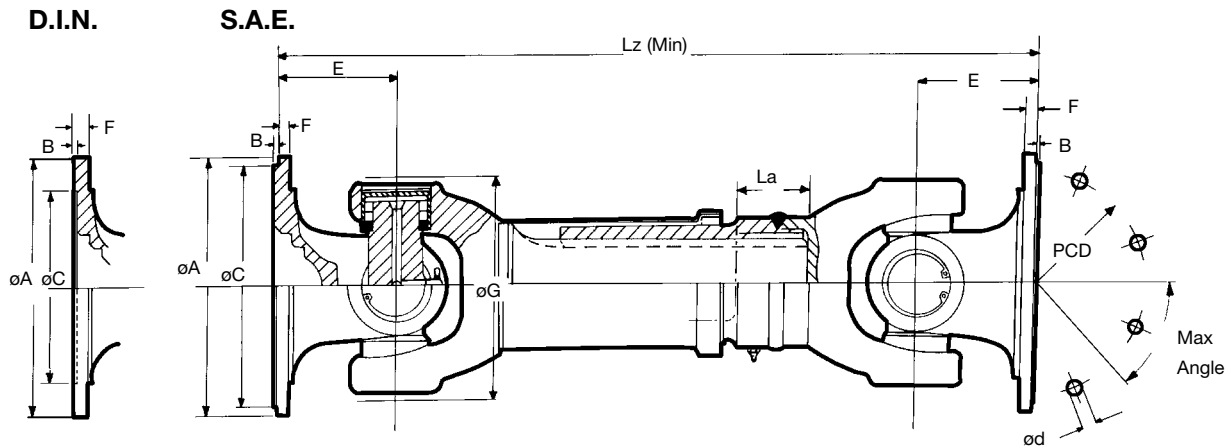
All dimensions in millimetres
 Shaft weight in kilograms
 Holes in SAE Flanges are not equi-spaced



Telescopic Driveshafts (Shaft Type A)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	E	F	øG	øH	Lz (Min.)	La (Ext.)	WEIGHT (Lz Min.)
SAE IMPERIAL FLANGE FITTINGS															
4000	65	65A515101	30°	146	1.8	95.25	120.65	4 / 12.7	72	10	125	70	546	100	17
		65A515104	30°	146	1.8	95.25	120.65	4 / 12.7	72	10	125	90	546	100	17
8000	75	75A606004	25°	180	1.6	168.275	155.58	8 / 9.5	72	10	155	90	576	100	27
		75A616104	35°	180	1.6	168.275	155.58	8 / 9.5	85	10	155	90	602	100	27
		75A656504	25°	180	1.6	168.275	155.58	8 / 10	72	10	155	90	576	100	27
		75A666604	35°	180	1.6	168.275	155.58	8 / 10	85	10	155	90	602	100	27
		75A707004	25°	203	1.8	196.85	184.15	8 / 9.5	72	10	155	90	576	100	27
		75A717104	35°	203	1.8	196.85	184.15	8 / 9.5	85	10	155	90	602	100	27
		75A757504	25°	203	1.8	196.85	184.15	8 / 10	72	10	155	90	576	100	27
		75A767604	35°	203	1.8	196.85	184.15	8 / 10	85	10	155	90	602	100	27
		75A818104	35°	203	1.8	196.85	184.15	12 / 11.1	85	10	155	90	602	100	27
		17500	95	95A828208	30°	203	1.8	196.85	184.15	12 / 11.1	92	12	174	110	769
95A909008	30°			287	4.0	222.25	247.65	8 / 16	112	20	174	110	809	130	61
DIN METRIC FLANGE FITTINGS															
4000	65	65A121201	18°	120	2.5	75	101.5	8 / 10	60	8	125	70	522	100	17
		65A121204	18°	120	2.5	75	101.5	8 / 10	60	8	125	90	522	100	17
		65A202001	30°	150	2.5	90	130	8 / 12	72	10	125	70	546	100	17
8000	75	75A202004	25°	150	2.5	90	130	8 / 12	72	10	155	90	576	100	27
		75A232304	35°	150	2.5	90	130	8 / 12	85	10	155	90	602	100	27
		75A343404	35°	165	3.5	95	140	8 / 16	85	10	155	90	602	100	27
		75A404004	25°	180	2.5	110	155.5	8 / 14	72	10	155	90	576	100	27
		75A414104	35°	180	2.5	110	155.5	8 / 14	85	10	155	90	602	100	27
		75A424204	35°	180	2.5	110	155.5	8 / 16	85	10	155	90	602	100	27
10000	85	85A232306	30°	150	3	90	130	8 / 12	86	12	158	100	660	100	37
		85A424206	30°	180	3.6	110	155.5	8 / 16	86	12	158	100	660	100	37
17500	95	95A444408	30°	180	3.5	110	155.5	10 / 16	96	15	174	110	769	110	61
		95A858508	30°	225	5.0	140	196	8 / 16	96	15	174	110	769	110	61
19000	97	97A444410	30°	180	3.6	110	155.5	10 / 16	110	15	204	120	830	140	65
		97A858510	30°	225	5	140	196	8 / 16	110	15	204	120	830	140	68
		97A959510	25°	250	6	140	218	8 / 18	110	18	204	120	830	140	72

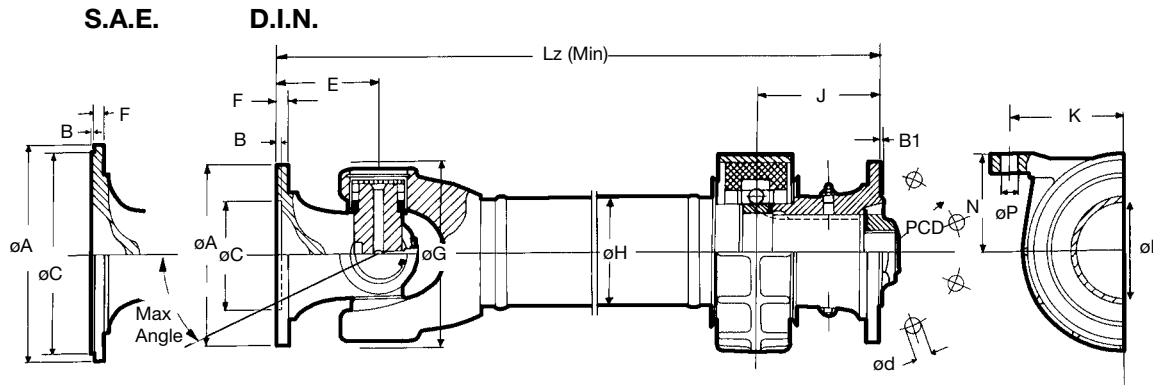
Cross toothed Flanges can also be offered, contact our Technical Sales Department for more information.



Short Coupled Driveshafts (Shaft Type Y)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	E	F	øG	Lz (Min.)	La (Ext.)	WEIGHT (Lz Min.)
SAE IMPERIAL FLANGE FITTINGS														
4000	65	65Y515100	30°	146	1.8	95.25	120.65	4 / 12.7	72	10	125	404 - 464	40 - 100	16
8000	75	75Y606000	25°	180	1.6	168.275	155.58	8 / 9.5	72	10	155	460 - 530	30 - 100	26
		75Y616100	35°	180	1.6	168.275	155.58	8 / 9.5	85	10	155	486 - 556	30 - 100	26
		75Y656500	25°	180	1.6	168.275	155.58	8 / 10	72	10	155	460 - 530	30 - 100	26
		75Y666600	35°	180	1.6	168.275	155.58	8 / 10	85	10	155	486 - 556	30 - 100	26
		75Y707000	25°	203	1.8	196.85	184.15	8 / 9.5	72	10	155	460 - 530	30 - 100	26
		75Y717100	35°	203	1.8	196.85	184.15	8 / 9.5	85	10	155	486 - 556	30 - 100	26
		75Y757500	25°	203	1.8	196.85	184.15	8 / 10	72	10	155	460 - 530	30 - 100	26
		75Y767600	35°	203	1.8	196.85	184.15	8 / 10	85	10	155	486 - 556	30 - 100	26
17500	95	95Y828200	30°	203	1.8	196.85	184.15	12 / 11.1	85	10	155	486 - 556	30 - 100	26
		95Y909000	30°	287	4.0	222.25	247.65	8 / 16	112	20	174	630 - 720	40 - 130	57
DIN METRIC FLANGE FITTINGS														
4000	65	65Y121200	18°	120	2.5	75	101.5	8 / 10	60	8	125	380 - 440	40 - 100	16
		65Y202000	30°	150	2.5	90	130	8 / 12	72	10	125	404 - 464	40 - 100	16
8000	75	75Y202000	25°	150	2.5	90	130	8 / 12	72	10	155	460 - 530	30 - 100	26
		75Y232300	35°	150	2.5	90	130	8 / 12	85	10	155	486 - 556	30 - 100	26
		75Y343400	35°	165	3.5	95	140	8 / 16	85	10	155	486 - 556	30 - 100	26
		75Y404000	25°	180	2.5	110	155.5	8 / 14	72	10	155	460 - 530	30 - 100	26
		75Y414100	35°	180	2.5	110	155.5	8 / 14	85	10	155	486 - 556	30 - 100	26
		75Y424200	35°	180	2.5	110	155.5	8 / 16	85	10	155	486 - 556	30 - 100	26
10000	85	85Y232300	30°	150	3	90	130	8 / 12	86	12	158	495 - 600	45 - 110	30
		85Y424200	30°	180	3.6	110	155.5	8 / 16	86	12	158	400 - 600	40 - 110	28
17500	95	95Y444400	30°	180	3.5	110	155.5	10 / 16	96	15	174	590 - 680	40 - 130	57
		95Y858500	30°	225	5.0	140	196	8 / 16	96	15	174	590 - 680	40 - 130	57
19000	97	97Y444400	30°	180	3.6	110	155.5	10 / 16	110	15	204	650 - 720	80 - 110	60
		97Y858500	30°	225	5	140	196	8 / 16	110	15	204	550 - 720	40 - 110	56
		97Y959500	25°	250	6	140	218	8 / 18	110	18	204	650 - 720	80 - 110	66

NOTE:
The above Driveshafts are standard assemblies. Shorter Coupled Driveshafts can be manufactured using special parts. Contact our Technical Sales Department for more information



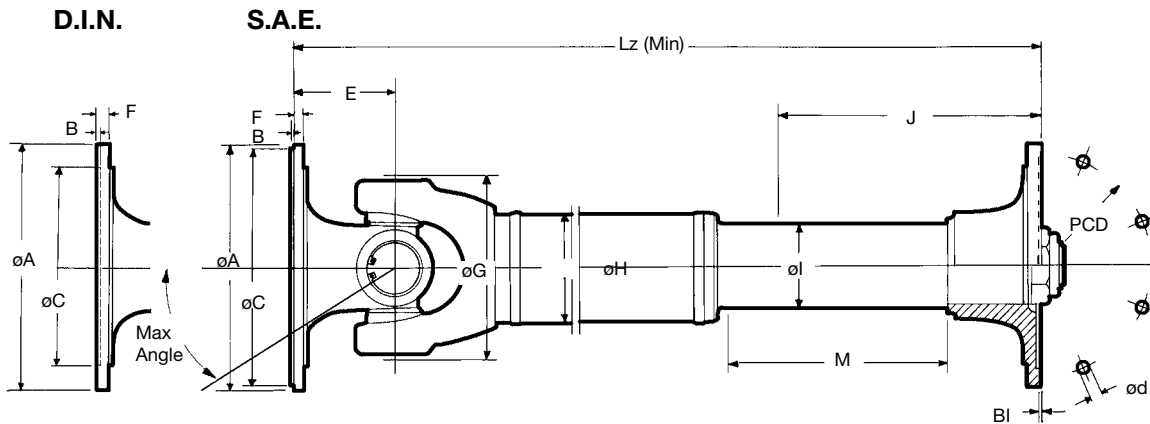
Midship Driveshafts (Shaft Type M)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	B1	C	PCD	No. / d	E	F	øG	øH	øl	J	K	N	øP	Lz (Min.)	WEIGHT (Lz Min.)
SAE IMPERIAL FLANGE FITTINGS																				
4000	65	65M515101	30°	146	1.8	2	95.25	120.65	4 / 12.7	72	10	125	70	45	89.7	96.8	69	12.7	281	17.5
		65M515102	30°	146	1.8	2	95.25	120.65	4 / 12.7	72	10	125	89	45	89.7	96.8	69	12.7	292	17.5
		65M515301	30°	146	1.8	2	95.25	120.65	4 / 12.7	72	10	125	70	45	89.7	96.8	69	12.7	281	17.5
		65M515302	30°	146	1.8	2	95.25	120.65	4 / 12.7	72	10	125	89	45	89.7	96.8	69	12.7	292	17.5
8000	75	75M606004	25°	180	1.6	1.5	168.275	155.58	8 / 9.5	72	10	155	90	65	108	96.8	82	14.2	307	28
		75M606304	25°	180	1.6	1.5	168.275	155.58	8 / 9.5	72	10	155	90	65	87.5	96.8	82	14.2	295	28
		75M616004	35°	180	1.6	1.5	168.275	155.58	8 / 9.5	85	10	155	90	65	108	96.8	82	14.2	320	28
		75M616304	35°	180	1.6	1.5	168.275	155.58	8 / 9.5	85	10	155	90	65	87.5	96.8	82	14.2	308	28
		75M707004	25°	203	1.8	1.5	196.85	184.15	8 / 9.5	72	10	155	90	65	108	96.8	82	14.2	307	28
		75M717004	35°	203	1.8	1.5	196.85	184.15	8 / 9.5	85	10	155	90	65	108	96.8	82	14.2	320	28
		75M818004	35°	203	1.8	1.5	196.85	184.15	12 / 11.1	85	10	155	90	65	108	96.8	82	14.2	320	28
17500	95	95M828008	30°	203	1.8	1.5	196.85	184.15	12 / 11.1	92	12	174	110	65	105	96.8	82	14.2	384	63
DIN METRIC FLANGE FITTINGS																				
4000	65	65M121201	18°	120	2.5	2.3	75	101.5	8 / 10	60	10	125	70	45	86.5	96.8	69	12.7	254	17.5
		65M121202	18°	120	2.5	2.3	75	101.5	8 / 10	60	10	125	89	45	86.5	96.8	69	12.7	277	17.5
		65M202001	30°	150	2.5	2.3	90	130	8 / 12	60	10	125	70	45	86.5	96.8	69	12.7	266	17.5
		65M202002	30°	150	2.5	2.3	90	130	8 / 12	60	10	125	89	45	86.5	96.8	69	12.7	289	17.5
8000	75	75M202004	25°	150	2.5	2.3	90	130	8 / 12	72	10	155	90	65	105	96.8	82	14.2	305	28
		75M232004	35°	150	2.5	2.3	90	130	8 / 12	85	10	155	90	65	105	96.8	82	14.2	318	28
		75M232404	35°	150	2.5	2.3	90	130	8 / 12	85	10	155	90	65	105	100	82	14.2	318	28
		75M343204	35°	165	3.5	3.3	95	140	8 / 16	85	10	155	90	65	105	96.8	82	14.2	318	28
		75M404004	25°	180	2.5	2.3	110	155.5	8 / 14	72	10	155	90	65	105	96.8	82	14.2	305	28
		75M414004	35°	180	2.5	2.3	110	155.5	8 / 14	85	10	155	90	65	105	96.8	82	14.2	318	28
		75M424204	35°	180	2.5	2.3	110	155.5	8 / 16	85	10	155	90	65	105	96.8	82	14.2	318	28

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Minimum Fixed length

All dimensions in millimetres
 Shaft weight in kilograms



Industrial Midship Driveshafts (Shaft Type B)

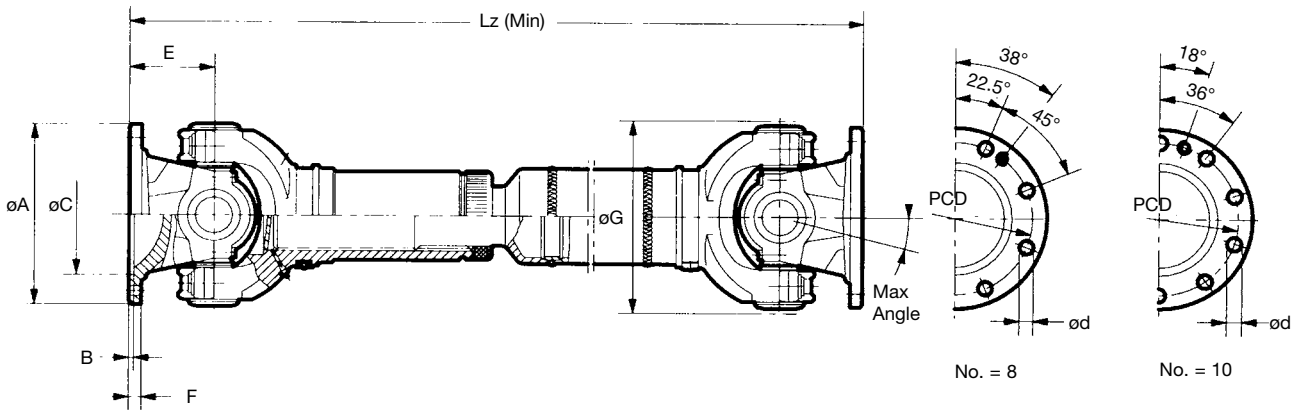
RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	B1	øC	PCD	No. / ød	E	F	øG	øH	øI	J	M	Lz (Min.)	WEIGHT (Lz Min.)
SAE IMPERIAL FLANGE FITTINGS																		
8000	75	75B707004	25°	203	1.8	1.5	196.85	184.15	8 / 9.5	72	10	155	90	70	175	190	445	28
		75B717004	35°	203	1.8	1.5	196.85	184.15	8 / 9.5	85	10	155	90	70	175	190	458	28
		75B818004	35°	203	1.8	1.5	196.85	184.15	12 / 11.1	85	10	155	90	70	175	190	458	28
DIN METRIC FLANGE FITTINGS																		
4000	65	65B121201	18°	120	2.5	2.3	75	101.5	8 / 10	60	10	125	70	60	151	152	380	15
		65B121204	18°	120	2.5	2.3	75	101.5	8 / 10	60	10	125	90	60	151	152	367	15
		65B202001	30°	150	2.5	2.3	90	130	8 / 12	72	10	125	70	60	151	152	392	16
		65B202004	30°	150	2.5	2.3	90	130	8 / 12	72	10	125	90	60	151	152	379	16
8000	75	75B202004	25°	150	2.5	2.3	90	130	8 / 12	72	10	155	90	70	175	190	445	24
		75B232004	35°	150	2.5	2.3	90	130	8 / 12	85	10	155	90	70	175	190	458	24
		75B404004	25°	180	2.5	2.3	110	155.5	8 / 14	72	10	155	90	70	175	190	445	25
		75B414004	35°	180	2.5	2.3	110	155.5	8 / 14	85	10	155	90	70	175	190	458	25
10000	85	85B232306	30°	150	3	2.3	90	130	8 / 12	86	12	158	100	70	175	190	460	26
		85B424206	30°	180	3.6	2.8	110	155.5	8 / 16	86	12	158	100	70	175	190	460	26
17500	95	95B858508	30°	225	5.0	4.5	140	196	8 / 16	96	15	174	110	75	221	280	600	58

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Minimum Fixed Length.

All dimensions in millimetres
 Shaft weight in kilograms

J is given as the recommended distance from the Flange face to the centre line of the Support Bearing. The Bearing can otherwise be located along the length M.



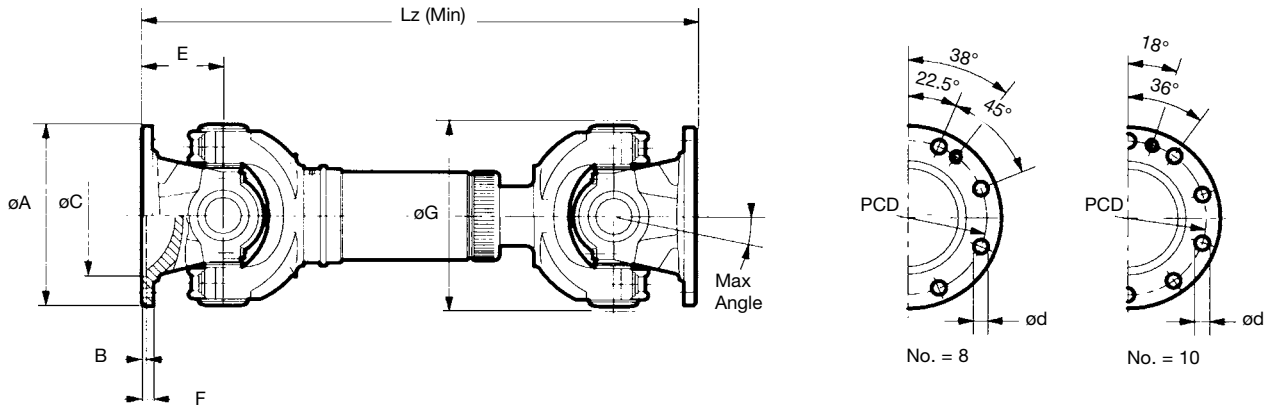
Telescopic Driveshafts (Shaft Type A)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	E	F	øG	Lz (Min.)	La (Ext.)	WEIGHT (Lz Min.)
18000	105	105A2250	15°	225	5.0	140	196	8 / 16	108	15	225	790	75	96
25000	115	115A2500	15°	250	6.0	140	218	8 / 18	135	18	225	960	100	123
37000	125	125A2850	15°	285	7.0	175	245	8 / 20	135	20	285	1030	100	161
52000	135	135A3150	15°	315	7.0	175	280	8 / 22	150	22	315	1220	120	257
72000	145	145A3500	15°	350	8.0	220	310	10 / 22	170	25	350	1360	135	375
94000	155	155A3900	15°	390	8.0	250	345	10 / 24	190	28	390	1490	150	518
136000	165	165A4350	15°	435	10.0	280	385	10 / 27	210	32	435	1620	170	693

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms



Short Coupled Driveshafts (Shaft Type Y)

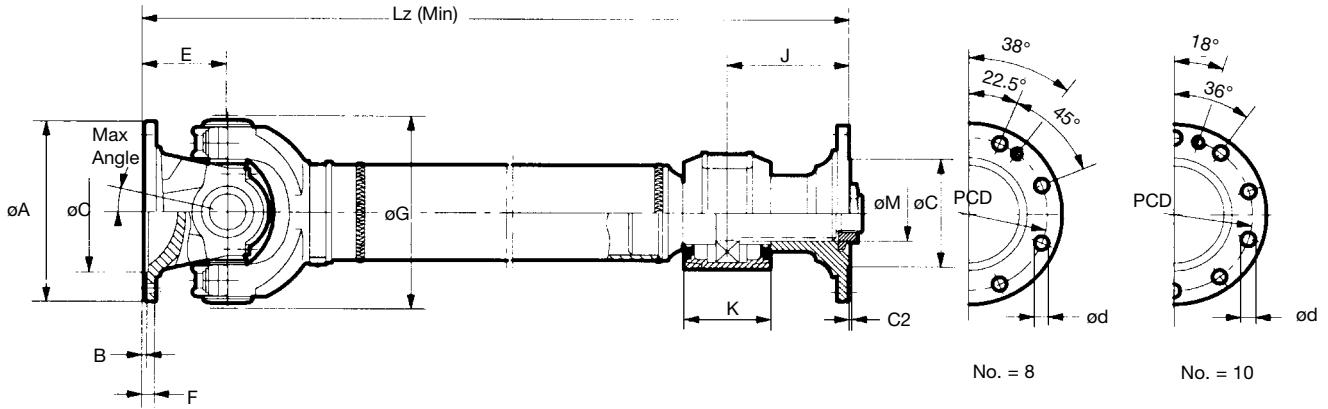
RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	E	F	øG	Lz A	La A	Lz B	La B	Lz C	La C	WEIGHT B (Lz Min.)
18000	105	105Y2250	15°	225	5	140	196	8 / 16	108	15	225	650	75	600	45	550	40	90
25000	115	115Y2500	15°	250	6	140	218	8 / 18	135	18	225	840	90	780	50	710	40	118
37000	125	125Y2850	15°	285	7	175	245	8 / 20	135	20	285	855	100	795	60	735	60	156
52000	135	135Y3150	15°	315	7	175	280	8 / 22	150	22	315	1025	120	950	70	880	85	230
72000	145	145Y3500	15°	350	8	220	310	10 / 22	170	25	350	1160	135	1070	90	980	70	333
94000	155	155Y3900	15°	390	8	250	345	10 / 24	190	28	390	1280	150	1170	90	1070	75	490
136000	165	165Y4350	15°	435	10	280	385	10 / 27	210	32	435	1400	170	1300	105	1200	90	650

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length (Minimum)
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms

The above Driveshafts are standard assemblies. Shorter Coupled Driveshafts can be manufactured using special parts. Contact our Technical Sales Department for more information.



Industrial Midship Driveshafts (Shaft Type B)

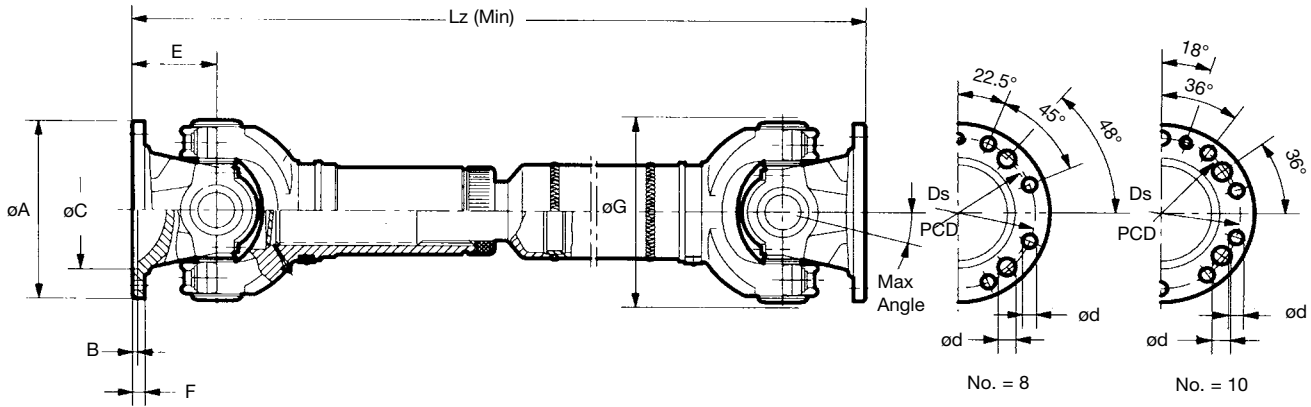
RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	C2	PCD	No. / ød	E	F	øG	K	J	Lz (Min.)	øM	WEIGHT (Lz Min.)
18000	105	105B2250	15°	225	5	140	4.5	196	8 / 16	108	15	225	135	192	640	80	85
25000	115	115B2500	15°	250	6	140	5.5	218	8 / 18	135	18	225	160	235	755	100	106
37000	125	125B2850	15°	285	7	175	6.5	245	8 / 20	135	20	285	160	235	780	100	137
52000	135	135B3150	15°	315	7	175	6.5	280	8 / 22	150	22	315	190	300	830	130	211
72000	145	145B3500	15°	350	8	220	7	310	10 / 22	170	25	350	215	335	920	150	305
94000	155	155B3900	15°	390	8	250	7	345	10 / 24	190	28	390	225	355	1035	160	428
136000	165	165B4350	15°	435	10	280	9	385	10 / 27	210	32	435	225	355	1080	160	560

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Minimum Fixed length

All dimensions in millimetres
 Shaft weight in kilograms

Heavy Duty Data Sheet (with dowel pins)



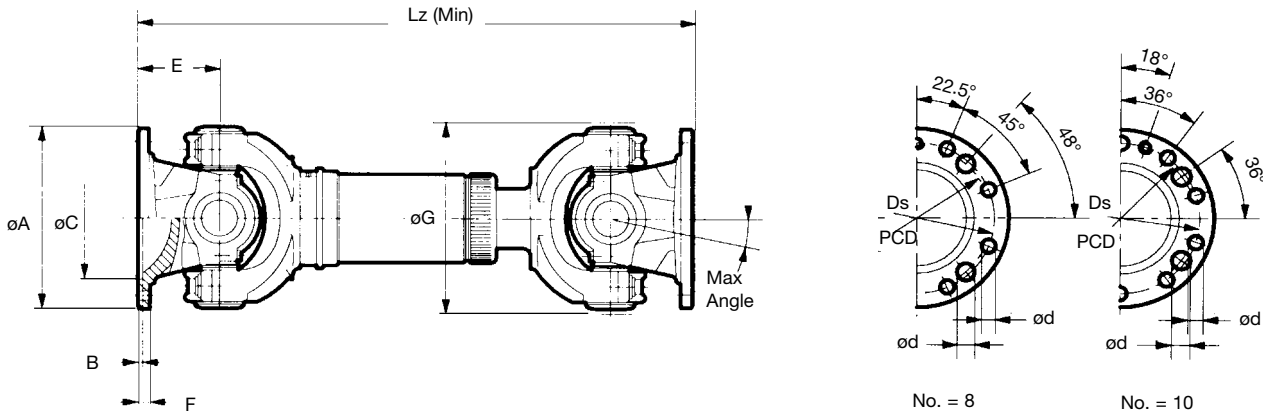
Telescopic Driveshafts (Shaft Type A)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	Ds	No / ød DOWEL	E	F	øG	Lz (Min)	La (Ext)	WEIGHT (Lz Min)
33000	106	106A2250	15°	225	5	140	196	8 / 16	192	4 / 21	108	15	225	790	75	98
40000	116	116A2500	15°	250	6	140	218	8 / 18	214	4 / 25	135	18	225	960	100	125
47000	126	126A2850	15°	285	7	175	245	8 / 20	240	4 / 28	135	20	285	1030	100	163
70000	136	136A3150	15°	315	7	175	280	8 / 22	270	4 / 30	150	22	315	1220	120	259
102000	146	146A3500	15°	350	8	220	310	10 / 22	300	4 / 32	170	25	350	1360	135	381
145000	156	156A3900	15°	390	8	250	345	10 / 24	340	4 / 32	190	28	390	1490	150	518
195000	166	166A4350	15°	435	10	280	385	10 / 27	378	4 / 35	210	32	435	1620	170	693

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms



Short Coupled Driveshafts (Shaft Type Y)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	Ds	No. / ød DOWEL	E	F	øG	Lz A	La A	Lz B	La B	Lz C	La C	WEIGHT B (Lz Min.)
33000	106	106Y2250	15°	225	5	140	196	8 / 16	192	4 / 21	108	15	225	650	75	600	45	550	40	72
40000	116	116Y2500	15°	250	6	140	218	8 / 18	214	4 / 25	135	18	225	840	90	780	50	710	40	118
47000	126	126Y2850	15°	285	7	175	245	8 / 20	240	4 / 28	135	20	285	855	100	795	60	735	60	156
70000	136	136Y3150	15°	315	7	175	280	8 / 22	270	4 / 30	150	22	315	1025	120	950	70	880	85	230
102000	146	146Y3500	15°	350	8	220	310	10 / 22	300	4 / 32	170	25	350	1160	135	1070	90	980	70	333
145000	156	156Y3900	15°	390	8	250	345	10 / 24	340	4 / 32	190	28	390	1280	150	1170	90	1070	75	490
195000	166	166Y4350	15°	435	10	280	385	10 / 27	378	4 / 35	210	32	435	1400	170	1300	105	1200	90	650

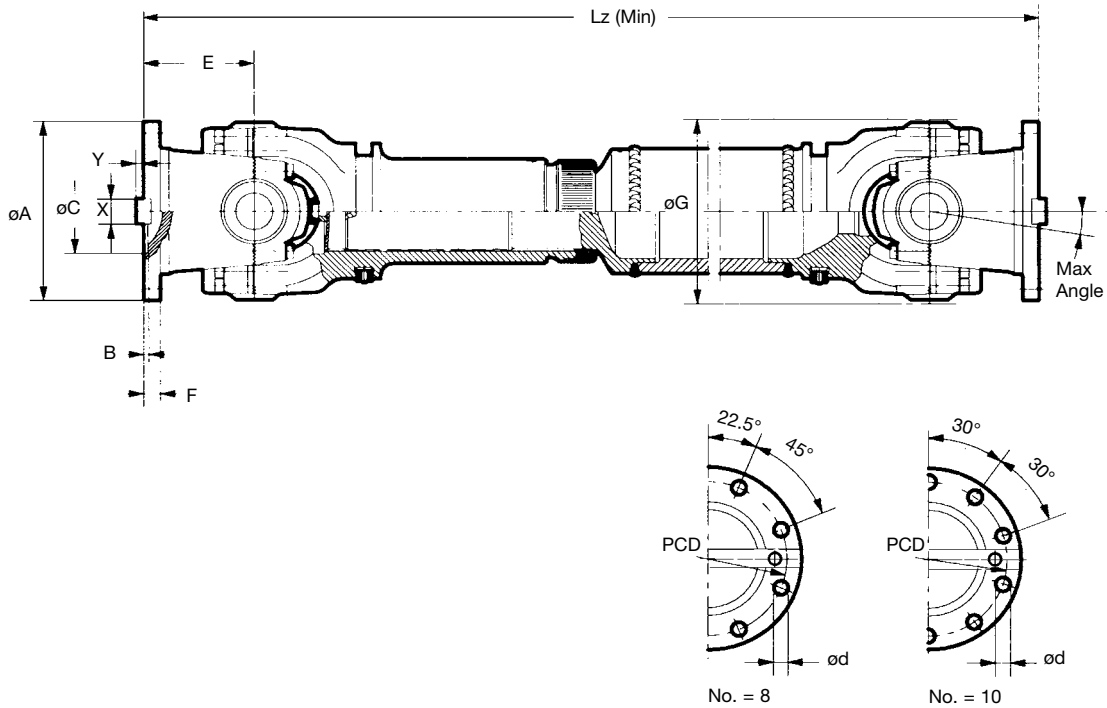
NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms

The above Driveshafts are standard assemblies. Shorter Coupled Driveshafts can be manufactured using special parts. Contact our Technical Sales Department for more information.

Heavy Duty Data Sheet (with face key)



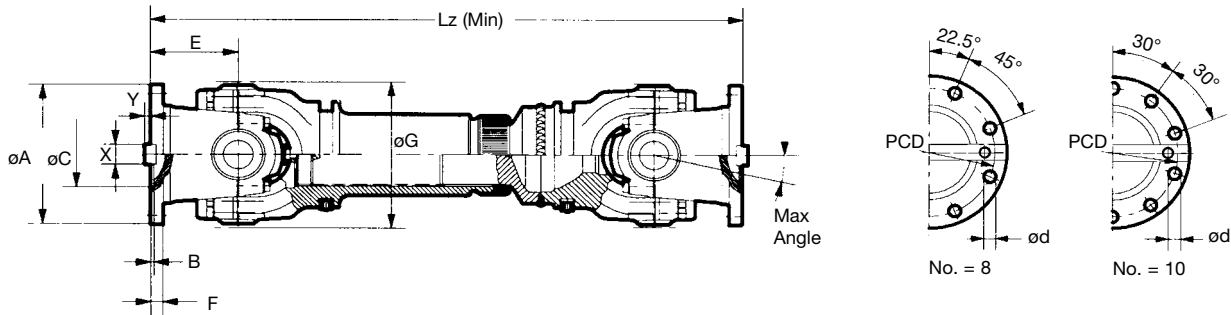
Telescopic Driveshafts (Shaft Type A)

RATING Tsd (Nm)	SERIES	PART NUMBER	MAX ANGLE	øA	B	øC	PCD	No. / ød	E	F	øG	X	Y	Lz (Min.)	La (Ext.)	WEIGHT (Lz Min.)
44000	107	107A2250	15°	225	5	105	196	8 / 17	135	20	225	32	9	965	85	120
64000	117	117A2500	15°	250	6	105	218	8 / 19	145	25	250	40	12.5	1035	90	170
98000	127	127A2850	15°	285	7	125	245	8 / 21	155	27	285	40	15	1180	120	250
140000	137	137A3150	15°	315	8	130	280	10 / 23	170	32	315	40	15	1375	135	370
190000	147	147A3500	15°	350	8	155	310	10 / 23	185	35	350	50	16	1485	150	450
260000	157	157A3900	15°	390	8	170	345	10 / 25	205	40	390	70	18	1640	160	720

NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms



Short Coupled Driveshafts (Shaft Type Y)

RATING Tsd(Nm)	SERIES	PART NUMBER	MAX ANGLE	ϕA	B	ϕC	PCD	No. / ϕd	E	F	ϕG	X	Y	Lz A	La A	Lz B	La B	Lz C	La C	WEIGHT B (Lz Min.)
44000	107	107Y2250	15°	225	5	105	196	8 / 17	135	20	225	32	9	840	85	780	50	710	40	100
64000	117	117Y2500	15°	250	6	105	218	8 / 19	145	25	250	40	12.5	885	90	830	50	770	40	150
98000	127	127Y2850	15°	285	7	125	245	8 / 21	155	27	285	40	15	1025	120	950	70	880	60	210
140000	137	137Y3150	15°	315	8	130	280	10 / 23	170	32	315	40	15	1195	135	1100	90	980	60	350
190000	147	147Y3500	15°	350	8	155	310	10 / 23	185	35	350	50	16	1335	150	1225	90	1070	70	470
260000	157	157Y3900	15°	390	8	170	345	10 / 25	205	40	390	70	18	1420	160	1300	90	1200	70	640

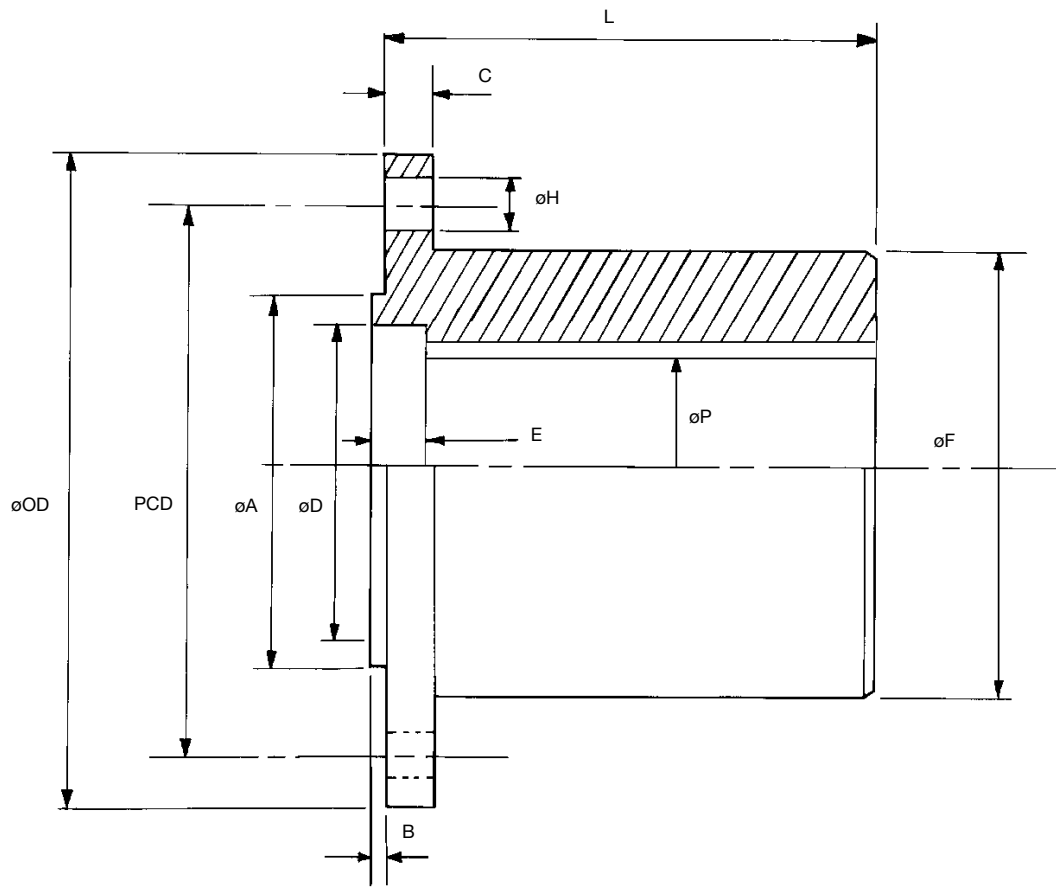
NOTE:

PCD = Pitch Circle Diameter
 Tsd (Nm) = Short duration torque
 Lz = Compressed length
 La = Extension

All dimensions in millimetres
 Shaft weight in kilograms

The above Driveshafts are standard assemblies. Shorter Coupled Driveshafts can be manufactured using special parts. Contact our Technical Sales Department for more information.

Companion Flange Data Sheet



DIN COMPANION FLANGE										
ϕOD	ϕA	PCD	B	C	ϕD	E	ϕF	ϕH	ϕP	L
90	47	74.5	2.3	8	*	*	61	8	35	60
100	57	84	2.3	8	*	*	70	8	45	75
120	75	101.5	2.3	8	*	*	84	10	55	90
150	90	130	2.3	10	*	*	110	12	75	110
180	110	155.5	2.3	10	*	*	132	14	90	135
225	140	196	4.8	15	*	*	171	16	115	185
250	140	218	5.8	18	*	*	189	18	130	195
285	175	245	6.5	20	*	*	213	20	145	205
315	175	280	7	22	*	*	247	22	165	215
350	220	310	7	25	*	*	277	22	185	225
390	250	345	7	28	*	*	308	24	205	235
435	280	385	9	32	*	*	342	27	230	245

*To suit customer requirements

PCD = Pitch Circle Diameter

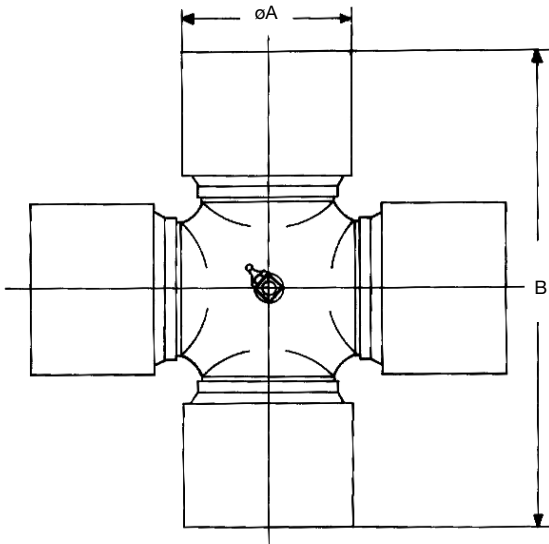
ϕP = Maximum Bore

L = Standard Length

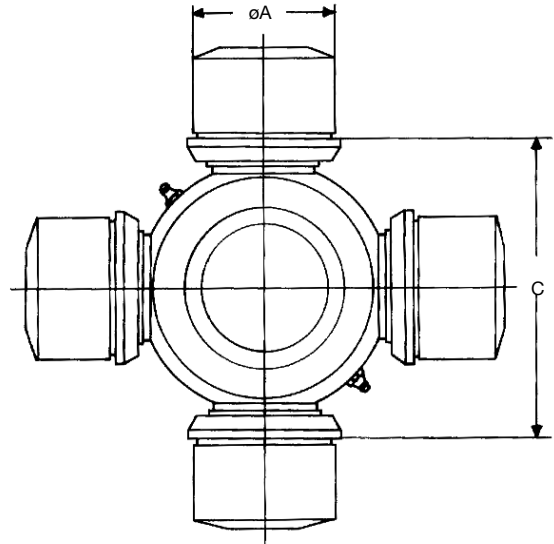
Other lengths available upon request.

All dimensions in millimetres

SAE Companion flanges are available upon request



Measurements refer to series 35-97 inclusive.



Measurements refer to series 105-165 inclusive.

Series	Part No.	Cup Dia "A"	Length "B"	Length "C"
25	25-0400	23.8	61.3	-
35	35-0400	27	81.8	-
45	45-0400	30.2	106.3	-
55	55-0400	39.7	115.9	-
65	65-0400	38	105.8	-
75	75-0400	48	131	-
85	85-0400	53	135	-
87	87-0400	53	158	-
95	95-0400	57	152	-
97	97-0400	65	172	-
105	105-0405	65	-	144
115	115-0405	74	-	154
125	125-0405	83	-	175
135	135-0405	95	-	190
145	145-0405	110	-	210
155	155-0405	120	-	235
165	165-0405	130	-	262

SPECIFICATION

NDE Clarke Driveshafts are supplied as complete units ready for installation into the vehicle or machine. They are balanced in accordance with Q(G) 16 VDI 2060, ISO 1940/41 and have a primer coat of paint.

Standard NDE Clarke Driveshafts are suitable for operation at ambient temperatures of -35°C to 60°C . Please contact us when using the Driveshafts in temperatures outside these conditions.

Before initial operation the Driveshaft must be greased using Lithium based grease with E.P. additives. The maximum greasing pressure is 15 bar.

TRANSPORTATION AND STORAGE

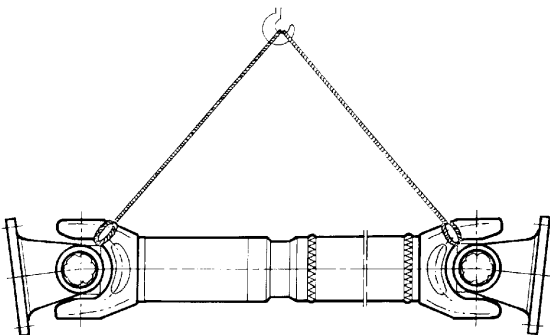
Since Driveshafts are manufactured as high quality products, they may suffer damage due to improper storage and transport, which could render them unusable.

The original NDE Clarke packing is only suitable for despatch and a short term storage. The Driveshafts should be stored in dry and weather protected areas. If the Driveshaft is to be stored for a long period, the Flange connecting faces should be treated with an anti-corrosion agent.

Transportation should be carried out with the Driveshafts in a horizontal position.

If the Driveshaft is put in any other position than horizontal, **it is essential to prevent the spline elements from sliding apart**. This, and the tilting of the joints may cause personal injuries. Any impact must be avoided.

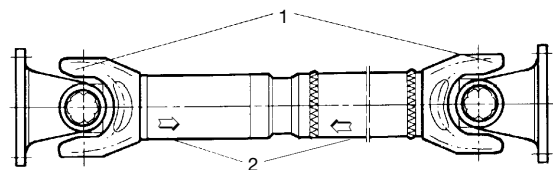
For the transportation of the Driveshafts we recommend the use of nylon ropes. The following sketch indicates a reasonable method.



INSTALLATION

For the installation of the Driveshafts, the following instructions must be observed:

- Check before immediate installation for possible transit damage.
- Driveshafts which have been stored for a long time should be regreased in working conditions before they are put into operation.
- When spray painting the Driveshafts, make sure that the area in which the Spline or the Seal glides is protected from paint.
- The faces of the Flanges must be free from anti-corrosion agents, paint, grease and dirt.
- Do not rotate the Driveshaft with assembly levers in the Joint because this may cause damage to the Joints, Grease Nipples or Air Relief Valves, where fitted.
- Nuts and Bolts of the correct size should be evenly tightened crosswise all round until securely locked to the recommended torque value. The Bolts should only be slightly oiled. Lubricants containing MOS_2 additives or similar must not be used.
- Check the position of the Yokes (1) according to drawing and ensure arrows are in line (2). See below.



- Before initial operation the Driveshaft must be greased using Lithium based grease with E.P. additives. The maximum greasing pressure is 15 bar.
- Connecting Flanges must be checked for concentricity, radial runout and fit to Shafts.

IMPORTANT

Guards - Rotating Shafts and Joints must be guarded to eliminate the possibility of physical contact or entanglement of clothing. It should be of rigid construction and firmly secured.

INSPECTION AND MAINTENANCE

Driveshaft inspection should be carried out at regular intervals and it would be reasonable to co-ordinate this with the maintenance work on other Vehicle parts. The maintenance intervals mentioned in the following section are only recommendations because maintenance intervals generally depend on the operating conditions of the Vehicle and on practical experience.

Driveshafts are used in a great variety of Industrial plants with very different operating conditions. We recommend inspections at regular intervals and, if possible, coordinate it with maintenance work on other parts of the equipment. However maintenance work should be carried out once a year at least.

- Check the Flange Bolts for tightness and retighten them with the prescribed torque. If they need replacing, Nuts and Bolts of the correct size should be evenly tightened crosswise all round until securely locked to the recommended torque value. The Bolts should only be slightly oiled. Lubricants containing MOS₂ additives or similar must not be used.
- Check lubrication schedule is being maintained.
- Backlash inspection. By lifting the Driveshaft check the Joint and the length compensation for visible or tangible backlash. If there is any perceptible play, the Driveshaft must be repaired.
- Check the Driveshaft for any unusual noise, vibration or abnormal behaviour and repair the damage, if any.

BOLTING

All inspections must include the checking of the Bolts for the prescribed tightening torques.

The Bolts should only be slightly oiled. Lubricants containing MOS₂ additives or similar must NOT be used.

LUBRICATION

The Driveshaft should be greased with a Lithium based Grease with EP additives.

Grease Nipples must be cleaned before greasing.

The maximum greasing pressure is 15 bar.

There are three greasing areas on the Driveshaft, the Universal Joints and the Splined Sleeve.

IMPORTANT

When lubricating Universal Joints, ensure that fresh Grease exudes from all four Bearing Seals to be certain that all Bearings have fresh Grease. The lubrication of the Splined Sleeve should be carried out with the Driveshaft fully compressed to prevent excessive axial force developing.

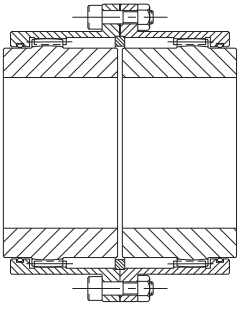
RE-GREASING INTERVALS

Recommended regreasing intervals (unless otherwise specified by the manufacturer of the Vehicle). The following maintenance intervals refer to European and comparable conditions. Other conditions may require shorter re-lubrication intervals.

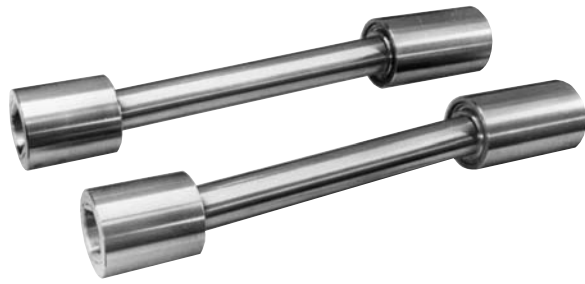
LUBRICATION PROGRAMME (Vehicles)	JOINTS & SLIDING SPLINES
Commercial Vehicles, Buses on road & similarly applied Vehicles	10,000 km or 3 months
Commercial Vehicles for on & off road use & similarly applied Vehicles	5,000 km or 2 months
Commercial & Construction Vehicles, Earth moving equipment, Tractors etc. & similarly applied Vehicles	2,500 km or 1 month

The recommended lubrication interval for Driveshafts used in Industrial plants in normal operating conditions is three months. Unfavourable effects like temperature, dirt and water may necessitate shorter lubricating intervals. We recommend adapting the lubricating intervals to the individual operating conditions.

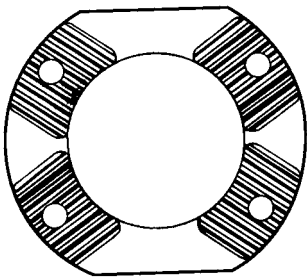
Other Products Available



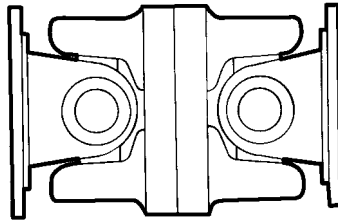
Gear Type Couplings



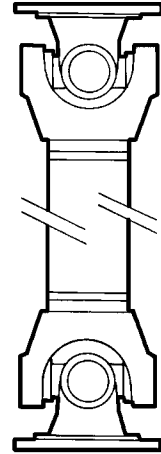
Special Mill Spindles



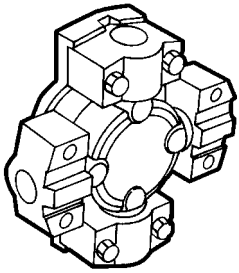
Serrated Flanges



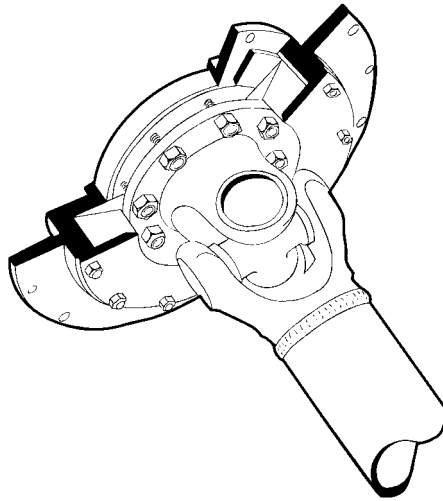
Double Joints



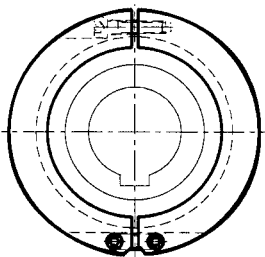
Fixed Length Shafts



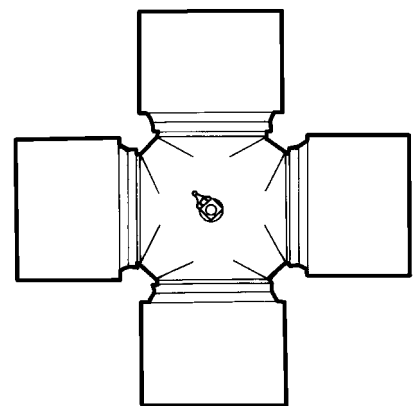
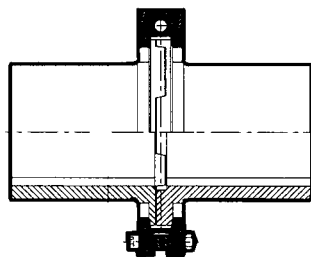
Mechanics Joints



Highly Flexible Couplings



Quick Release Flanges



**Component Parts for
Other Makes; i.e.
Universal Joints. Centre
Bearings etc.**

We've got the drive.....



HIGH PERFORMANCE UNIVERSAL DRIVESHAFTS



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