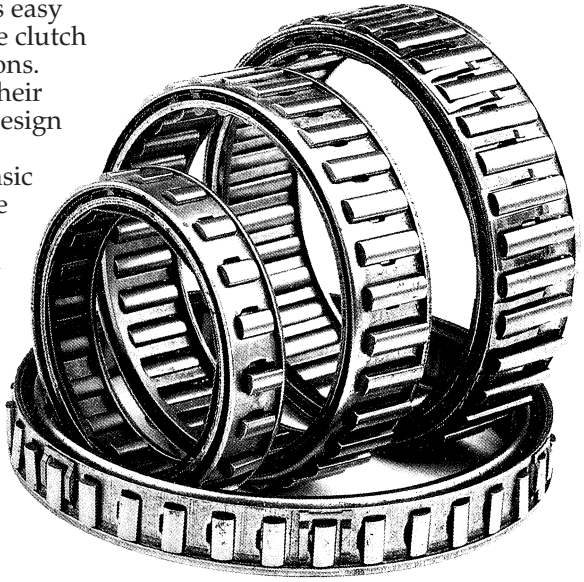
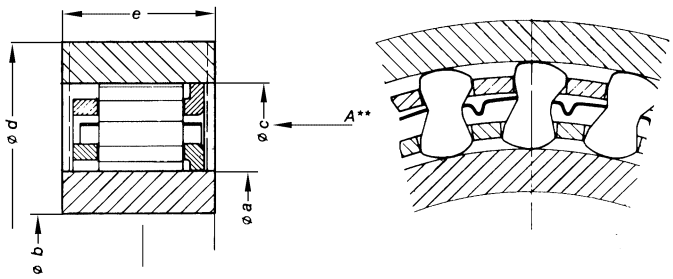
Sprag Clutches

The double cage sprag elements are complete units capable of high torque transmission within confined spaces. Their unit construction enables easy assembly into cylindrical inner and outer races to provide a complete clutch suitable for most overrunning, backstopping and indexing applications. The sprags are individually energised by a brass ribbon spring, but their relative movement to one another is controlled by the double cage design to ensure load sharing and prevent de-phasing of individual sprags. Standard sprags are manufactured from 52100 bearing steels. Two basic designs of sprag are available, disengaging types (Diseng.) where the sprag lifts-off from the inner race when the outer is rotated at high speeds, and engaging types (Eng.) where the contact forces between sprag and inner race increase as the outer race is rotated. The sprag element is designed to rotate with the outer housing, this being essential for correct operation of the unit. In applications with rapid speed changes additional clamping of the element to the housing is essential and this is achieved by clips/T bars fixed to the outer cage. To reduce wear of sprags during overrunning drag strips may be fixed to the inner cage to rotate this relative to the outer and so reduce sprag contact during overrun.
The table below shows dimensions and construction of standard sprag elements in heavy print are preferred sizes, normally available from stock, which should always be used for new designs unless large production volumes are envisaged.
Sprag elements are best applied where high torque transmission is required, but space is limited, and where direct installation into machine parts is required.
The clutches double cage design makes them particularly suitable where torsional vibrations are present. Ability to control the operating characteristics has made them suitable for a wide range of applications including turbine starters, marine drives, gearbox backstops, winches, printing machines and machine tools.





Dimensions

Clutch Part No.	Dimensions mm					Sprags		No. Drag Strips	No NClips or T Bar	Direction Operation **	Nominal Torque (2)	Approx Weight
Std Sprag	a* +.008 −.005	c +.013 −.013	e min	b max	d min	No.	Type				Nm	gms
133590	22.225	38.887	10.0	17	50	12	Diseng.			CW	74	30
13143	27.767	44.425	13.5	21	58	14	Eng.			CW	139	55
133034	30.342	47.000	13.5	23	62	14	Diseng.			CW	124	60
1310028	31.750	48.410	13.5	24	63	16	Diseng.		3	CW	159	66
133392	38.092	54.750	16.0	30	71	18	Diseng.			CCW	324	85
1310145	41.275	57.937	13.5	32	75	14	Diseng.		3	CW	210	90
132909	44.450	61.112	16.0	34	79	20	Diseng.	2	3	CW	424	100
133339	49.721	66.383	13.5	38	85	22	Diseng.	2	4	CW	366	100
1310003	49.721	66.383	13.5	38	85	22	Diseng.		4	CW	366	100
1310172	54.765	71.427	16.0	42	92	24	Eng.			CW	640	120
1310226	54.765	71.427	16.0	42	92	24	Diseng.	2	4	CW	610	130
136709	54.765	71.427	21.0	42	92	24	Eng.	3	10	CW	907	180
1310147	54.765	71.427	25.4	42	92	24	Diseng.	3	8	CW	1160	200
13239	57.760	74.427	16.0	45	95	26	Eng.			CW	710	110
136324	57.760	74.427	19.0	45	95	26	Eng.			***	710	130
1310299	59.537	76.200	28.9	46	98	26	Eng.		4	***	1418	240
136334	63.340	80.000	21.0	50	104	26	Diseng.			CW	806	175
1310080	72.217	88.882	13.5	56	115	30	Diseng.			CW	793	140
13168	72.217	88.882	21.0	56	115	30	Eng.			CCW	1520	185
134012	72.217	88.882	21.0	56	115	30	Eng.	4	10	CCW	1489	215
133687	79.698	96.363	13.5	62	124	24	Diseng.	3	4	CW	680	155
137322	79.698	96.363	25.4	62	124	34	Diseng.	5	12	CW	2396	280
138334	83.340	100.000	25.4	65	130	34	Diseng.			CW	2055	270
138316	83.597	102.596	25.4	65	132	34	Diseng.	5	12	CW	3032	275
134008	85.776	104.776	25.4	66	135	34	Eng.	5	17	CW	3073	280
136715	87.290	103.960	16.0	67	135	34	Diseng.			CW	1470	165
13261	103.231	119.983	16.0	80	154	40	Diseng.	6	10	CCW(1)	1900	205
13236	117.391	136.391	16.0	91	176	30	Diseng.	5	6	CCW	1970	240
1312334	123.340	140.000	25.4	96	181	50	Diseng.			CW	4800	400
133403	123.881	142.880	25.4	96	184	44	Eng.			CW	5740	460
133403B	123.881	142.880	25.4	96	184	44	Eng.		11	CW	5740	470

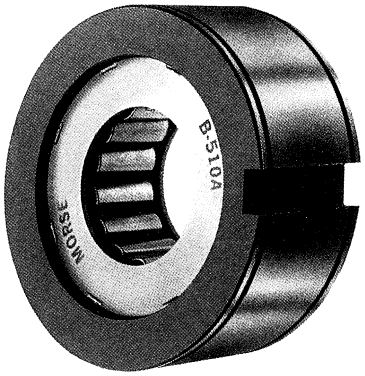
*For shaft dia. 75mm plus tolerance extended to ±0.013mm.
**Direction of rotation of outer race freewheeling viewed from 'A'.
***These clutches are fitted with end bearings.

(1) Note the centering flanges on type 13261 face each other.
(2) Nominal torque can be exceeded to maximum 1.7x for short periods.

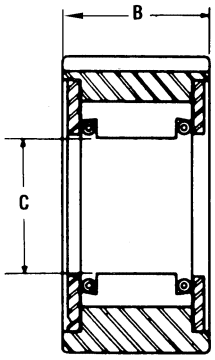
Tel +44 121 360 0155 Fax +44 121 325 1079 Email sales@crossmorse.com

Shaft Mount Backstop Clutches and Standard Races for Sprag Elements

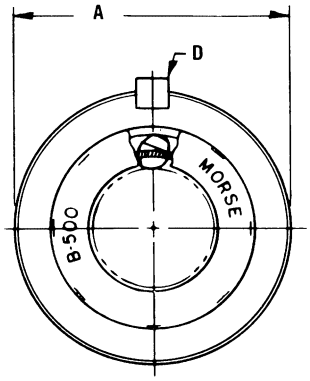
Shaft Mounted Sprag Clutch Assemblies for Backstop Applications

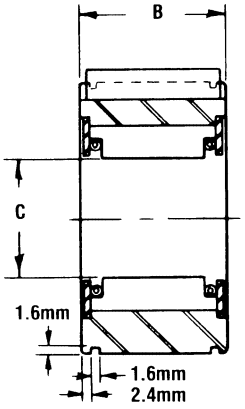


Types B200 & 500



B200 Series
Plain Outer Race





B500 Series with Circlip Grooves

Dimensions

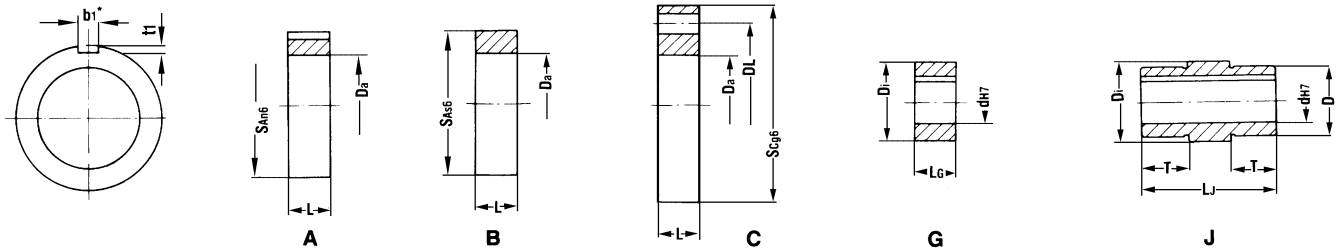
Clutch Size	Nominal Torque (1) Nm	Max Shaft Overrun rpm	Dimensions A mm	B mm	C (2) mm	D ins	Approx Weight kg	Standard Bearing with same O.D.
B 203A	53	2500	39.99/39.95	25.4	16.51/16.49	1/8x1/16	.23	6203
B 204A	68	2500	46.99/46.95	25.4	18.80/18.77	3/16x3/32	.34	6204
B 205A	108	2500	51.98/51.94	25.4	23.62/23.60	3/16x3/32	.34	6205
B 206A	237	2000	61.98/61.95	28.6	32.77/32.74	1/4x1/8	.45	6206
B 207A	373	2000	71.99/71.95	28.6	42.09/42.06	1/4x1/8	.57	6207
B 208A	550	1800	79.99/79.95	31.8	46.76/46.74	3/8x3/16	.79	6208
B210A	780	1800	89.99/89./95	31.8	56.11/56.08	3/8x3/16	.91	6210
B 501A	82	2500	39.99/39.97	25.4	16.51/16.50	1/8x1/16	.23	6203
B 502	82	2500	46.96/46.94	22.2	18.75/18.74	1/4x1/8	.34	6204
B 506	217	2000	61.96/61.94	25.4	28.79/28.77	1/4x1/8	.34	6206
B 507A	217	2000	61.96/61.94	28.6	24.65/24.63	1/4x1/8	.45	6206
B 509A	339	2000	71.96/71.94	31.8	28.79/28.77	1/4x1/8	.68	6207
B 510A	339	2000	79.97/79.94	34.9	32.93/32.91	3/8x3/16	.79	6208
B 511A	712	2000	79.97/79.94	41.3	34.99/34.97	3/8x3/16	.91	6208
B 512A	882	2000	89.97/89.94	41.3	39.14/39.12	3/8x3/16	.91	6210
B 513	1695	1800	120.65/120.62	44.4	51.96/51.94	1/2x1/4	1.13	-

(1) Max torque capacity for short periods 1.7x torque.

(2) Required shaft diameter for correct operation. Shaft should be made from high tensile carburising steels hardened to 58-62 Rc with minimum case 1.2mm after grinding. Grind to 0.4 um surface finish, with parallelism within 0.2%.

Inner and Outer Races for Standard Sprag Element

A range of standard inner and outer race for the most popular sizes of sprags, manufactured from carburised hardened steel with all faces finish ground. Maximum torque capacity of these races is controlled by the keys, and not sprag clutch rating. Housings for races should be manufactured to H7 tolerance and shafts to j6. Race type B transmits torque through heavy press fit in housing. These races eliminate the need to harden shafts and housings, and enable servicing of machines by replacement after normal service wear.



Type	Std Bore Sizes	Dimensions mm													For + Clutch Nos.
	dH7*	Da ±0.013	SA	Sc	L	b1	t1	No. Holes x dia.	DL ±0.1	Di +.008/ −.005	D j6	LG	LJ	T	
230A/230B/230C 230G/230J	10, 15, 20	54.750	72	95	16	6	3.5	8x7.0	78	39.092	35	16	50	17	133392
167A/167B/167C 167G/167J	20, 30, 35	71.427	90	110	16	10	5.0	8x9.0	95	54.765	50	16	54	19	1310172 1310226
168A/168B/168C 168G/168J	40, 45, 50	88.882	110	140	21	14	5.5	8x11.0	120	72.217	65	21	63	62	1310080 13168 134012

* Keyways to DIN 6885 sht. 1. + Races for other Sprag Clutches can be supplied to order.

Tel +44 121 360 0155
Fax +44 121 325 1079
Email sales@crossmorse.com