General Purpose Clutches

FRB

Overrunning, Backstopping Ball Bearing Supported, Sprag Clutches

FRB clutch is a high speed, centrifugal throw-out (C/T) Sprag design, supported by sealed ball bearings. The C/T Sprags are designed to "lift-off" from the races during high speed inner race overrunning. In this design, the center of mass of the Sprag is located so that when the inner race is overrunning, the centrifugal force of the Sprag overcomes the force of the energizing springs causing the Sprags to completely "pull away" from the races. The advantage of using C/T Sprags is that, when overrunning at above the lift-off speed, there is no contact between the Sprags and the races so there is no wear (for a longer operating life), no heat being generated (the clutch runs cooler), no Sprag drag so the resistance after run-in is lower. With sealed bearing this design is almost virtually maintenance free.

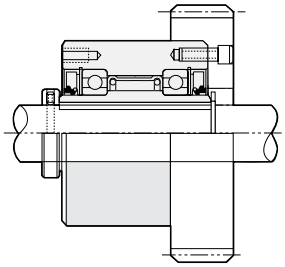
Grease Lubricated Clutches

The Model FRB is excellent for use as backstops by mounting the clutch's inner race on the rotating shaft and attaching or anchoring the clutch's outer race with a torque arm to a stationary member of the equipment. The Model FRB can also be used in applications that require low driving speeds and high inner race overrunning speeds.

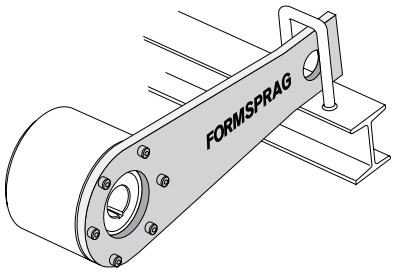
The C/T Sprag feature provides no Sprag contact or wear during overrunning when operated above the Sprag lift-off speeds. The typical recommended maintenance is to replace the bearings every three years. The Sprag assembly and races are to be re-lubricated with a thin coat of grease for corrosion protection at this time.

For further information, see Installation and Maintenance Bulletin No. 3045, P-4050 for the FRB Series.

Typical Mounting for Overrunning Applications



Typical Mounting for Backstopping Applications



The Model FRB clutches must be secured to the shaft by customer supplied snap ring, set collar, spacer, etc. All fasteners are recommended to be grade 8.

Specifications

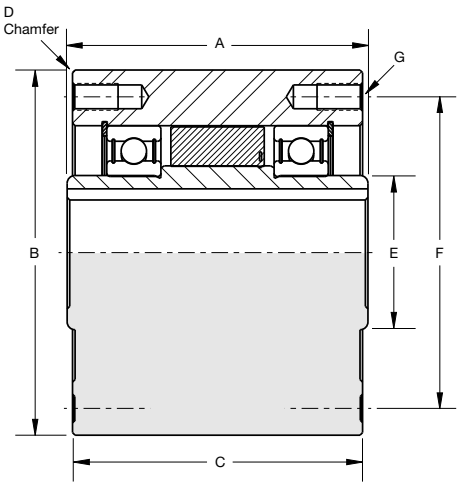
Size	Torque Capacity lb.ft. (Nm)	Maximum RPM				Resistance after run-in lb.ft. (Nm)	Lubrication Oil/Grease	Shipping Weight lb. (kg)
		Inner Race (RPM)	Outer Race (RPM)	Max. Drive Speed (RPM)	Sprag Lift-off Speed (RPM)			
400	89 (120)	5,000	340	340	820	.07 (.09)	Grease	6 (2.7)
500	510 (690)	4,000	330	330	700	.08 (.1)	Grease	10.5 (4.8)
600	810 (1100)	3,600	250	250	610	.15 (.21)	Grease	19 (8.6)
650	2,080 (2820)	4,000	210	210	510	.27 (.36)	Grease	24 (10.8)
700	2,700 (3660)	2,500	195	195	470	.38 (.52)	Grease	42 (19)
750	3,900 (5280)	1,800	210	210	480	1.25 (1.7)	Grease	83 (38)
800	11,800 (16000)	1,800	145	140	400	1.75 (2.38)	Grease	102 (46)

Note: Check key and shaft stress before making final clutch selection since this may determine the maximum allowable drive torque capacity.

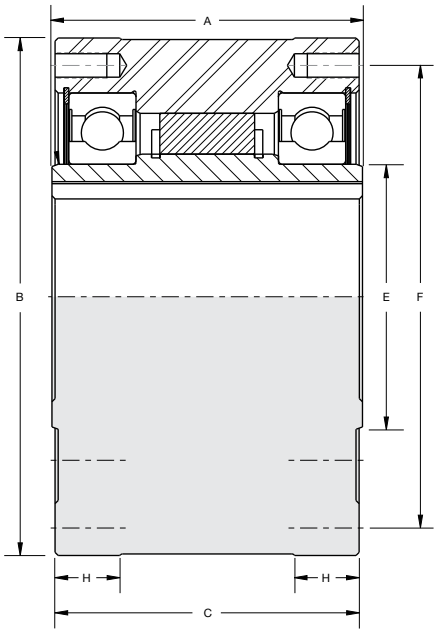
OSHA cover kits are designed for shaft end mounted FRB clutches and available from Formsprag from size 400 through 800. These cover kits provide not only the stationary cover enclosure required by OSHA, but provide additional protection for the clutch from abrasive environments as well.

Note: OSHA requires that a stationary guard must enclose clutches with rotating projecting parts and operating seven (7) feet or less above the floor.

FRB 400-700



FRB 750-800



Dimensions inches (mm)

Size	A	B	C	D	E	F	G Number	G Thread	G Depth	H
400	2.75 (69.85)	3.500/3.498 (88.90/88.85)	2.69 (68.26)	.06 x 45° (1.58 x 45°)	1.18 (29.97)	2.875 (73.02)	4 @ 90°	.312-24	.63 (16.00)	—
500	3.50 (88.90)	4.250/4.248 (107.95/107.90)	3.38 (85.72)	06 x 45° (1.58 x 45°)	1.77 (45.0)	3.625 (92.07)	4 @ 90°	.312-24	.63 (15.87)	—
600	3.75 (95.25)	5.375/5.373 (136.53/136.47)	3.62 (91.95)	.06 x 45° (1.58 x 45°)	2.56 (65.02) 2.72 (69.09)	4.750 (120.65)	6 @ 60°	.312-24	.63 (15.87)	—
650	3.50 (88.90)	6.500/6.498 (165.1/165.05)	3.375 (85.72)	0.09	3.15 (80.01)	5.75 (146.05)	8	.375-24	.79 (20.06)	—
700	5.00 (127.00)	7.125/7.123 (180.97/180.92)	4.88 (123.82)	.06 x 45° (1.58 x 45°)	3.74 (95.0) 4.00 (101.60)	6.250 (158.75)	8†	.375-24	.75 (19.05)	—
750	6.00 (152.4)	8.750/8.748 (222.25/222.20)	5.88 (149.22)	.06 x 45° (1.58 x 45°)	4.13 (104.90)	7.00 (177.80)	8*	.500-20	1.00 (25.40)	—
800	6.00 (152.4)	10.000/9.998 (254.00/253.95)	5.88 (149.22)	06 x 45° (1.58 x 45°)	5.12 (130.05)	8.94 (227.01)	8 @ 45°	.500-20	1.00 (25.40)	1.25 (31.75)

Notes:

† Six holes equally spaced at 60° plus two extra holes at 180°. Six hardened mounting screws should be used.

Bore sizes and keyseats****

inches (mm)

Size	Bore Size	Keyseat	Bore Range Min.	Bore Range Max.
400	.500 (12.70) 18 mm .875 (22.22)	1/8 x 1/16 (3.18 x 1.57) 6 x 2.8mm*** 3/16 x 1/16 (4.75 x 1.57	.437 (11.10)	.875 (22.22)
500	1.000 (25.40) 30mm 1.250 (31.75) 1.312 (33.32)	1/4 x 1/8 (6.35 x 3.18) 10 x 3.3mm*** 1/4 x 1/8 (6.35 x 3.18) 1/4 x 3/32 (6.35 x 2.29)	.750 (19.05)	1.312 (33.32)
600	1.250 (31.75) 1.5000 (38.10) 40mm 50mm 2.000 (50.80)	1/4 x 1/8 (6.35 x 3.18) 3/8 x 3/16 (9.52 x 4.75) 12 x 3.3mm*** 14 x 3.8mm*** 3/8 x 1/8 (9.52 x 3.18)	.937 (23.80)	2.000*‡ (50.80)
650	2.000 (50.80) 2.500 (63.50)	1/2 x 1/4 (12.70 x 6.35) 5/8 x 1/8 (15.87 x 3.18)	1.69 (42.85)	2.500 (63.5)
700	1.937 (49.20) 50mm 2.500 (63.50) 2.937 (74.60)	1/2 x 1/4 (12.70 x 6.35) 14 x 3.8mm 5/8 x 5/16 (15.87 x 7.93) 5/8 x 1/8 (15.87 x 3.18)	1.875 (47.62)	2.937**‡ (74.60)
750	2.500 (63.50) 2.937 (74.60) 80mm 3.250 (82.55)	5/8 x 5/16 (15.87 x 7.94) 3/4 x 3/8 (19.05 x 9.52) 22 x 5.4mm*** 3/4 x 1/4 (19.05 x 6.35)	2.250 (57.15)	3.437 (87.30)
800	3.250 (82.55) 3.500 (88.90) 90mm 3.937 (100.00) 4.437 (112.70)	3/4 x 3/8 (19.05 x 9.52) 7/8 x 7/16 (22.23 x 11.11) 25 x 5.4mm*** 1 x 1/2 (25.40 x 12.70) 1 x 1/4 (25.40 x 6.35)	2.625 (66.67)	4.437 (112.70)

* 1/2 x 1/8 keyway. ** 3/4 x 1/4 keyway.
*** Contact Formsprag for keyseat information.
**** For Bore Sizes/Shaft Tolerances, see page 126.
‡ The "E" dimension is larger for this bore size.