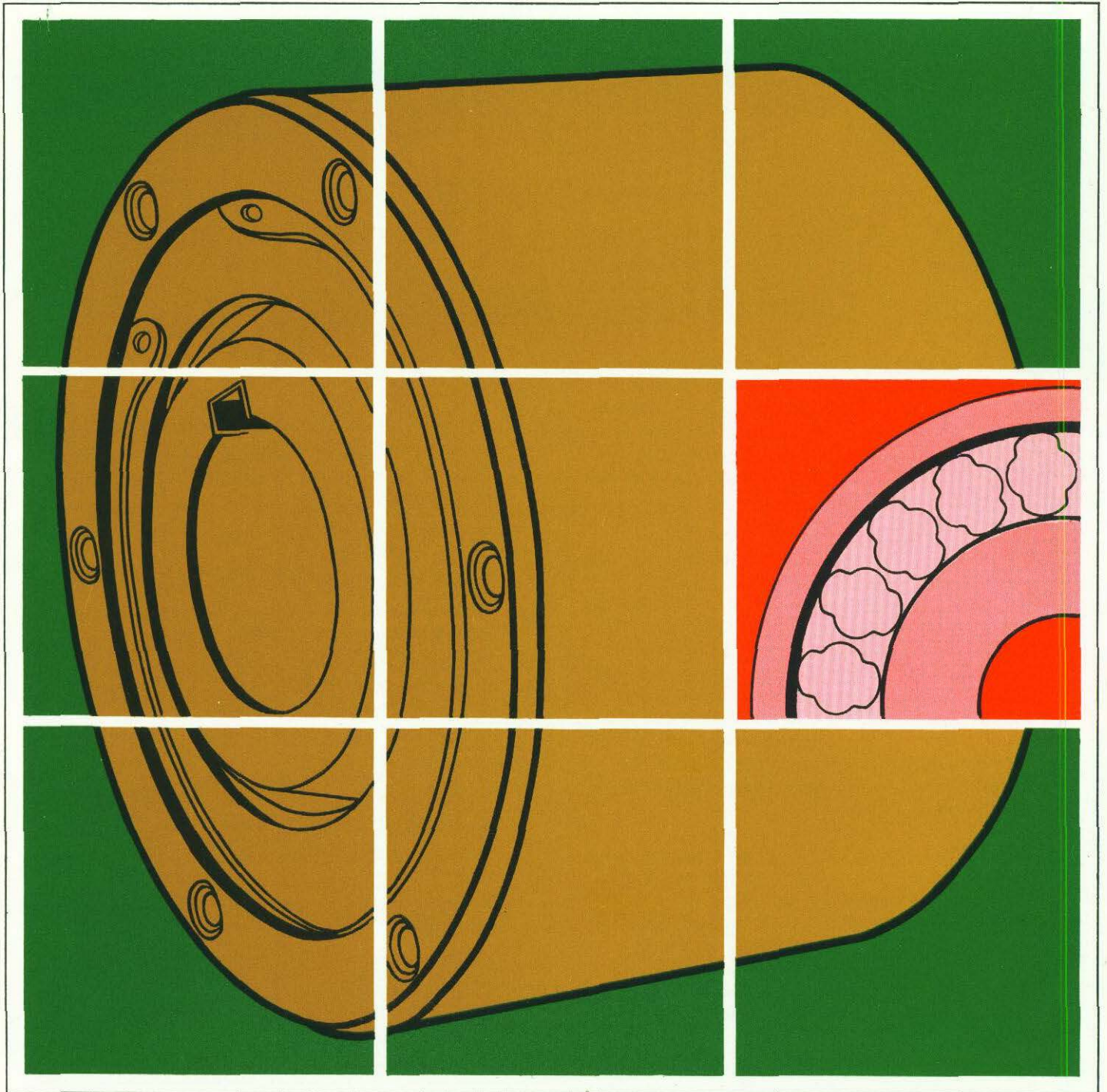


PRECISION

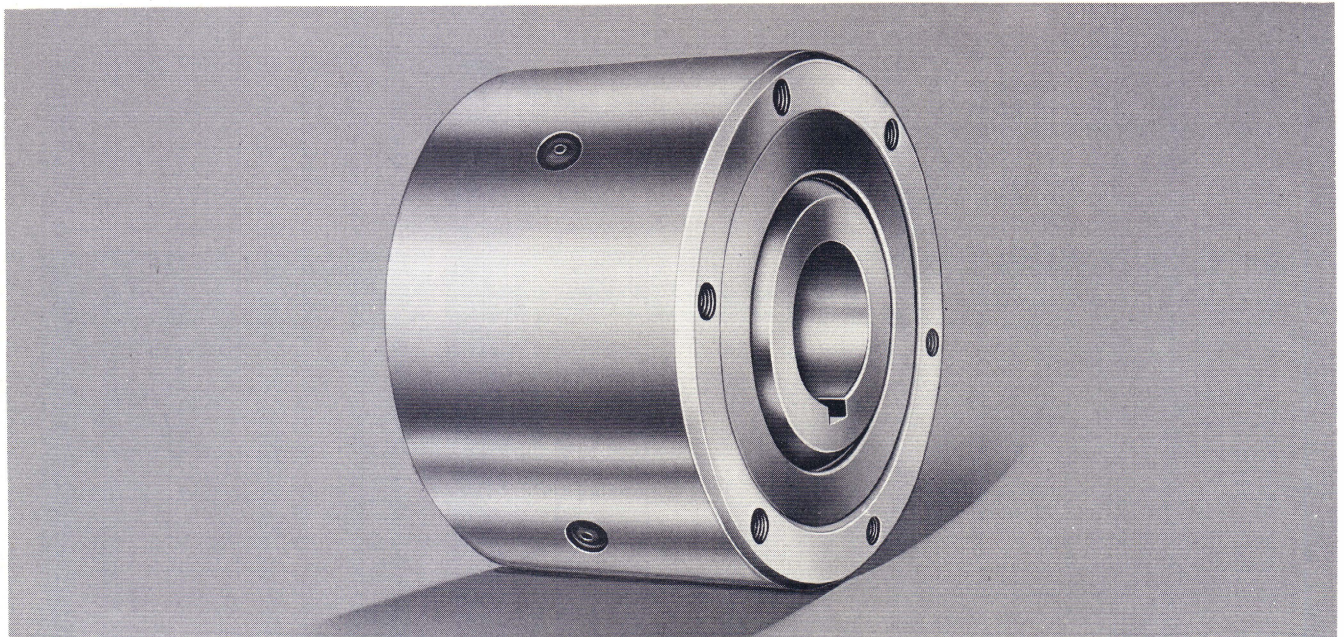
Sprag Clutches



Indexing ● Overrunning ● Backstopping

Sprag Clutch Type SF

With Individually Spring Loaded Sprags



Sprag Clutches are precision devices which lock the inner and outer races through wedging action of sprags to transmit torque in one direction of rotation and which will overrun in the opposite direction of rotation. These clutches are often referred to as freewheels, backstop or one-way clutches depending upon their application.

CONSTRUCTION

Precision Sprag Clutch type SF consists basically of a cylindrical inner race and a cylindrical outer race surrounding it, with an annular space left between the two races. A full complement of accurately formed sprags fills this annular space. These sprags are individually spring-energized and are guided in a specially designed cage. This ensures positive and instantaneous locking with minimum freewheeling resistance. Inner and outer races are supported by ball bearings to ensure high concentricity between the two races. High quality lip type oil seals are provided at both the sides.

Applications:

Precision sprag clutch type SF is having variety of applications of backstopping, indexing and free-wheeling. Industrywise it finds applications in almost every industry. Some of them are Textile Machinery, Material Handling equipments like conveyor belts, bucket elevators etc. Gear boxes, vertical Turbine Pumps, Machine Tools, Automatic Press Feeds, Printing Machinery etc.

Selection Procedure:

The following procedure is given only for guidance for the selection of sprag clutches. However we recommend that customers should consult us before arriving at their final selection.

- 1) Calculate torque to be transmitted from formula

$$T = \frac{7118.6 \times \text{HP}}{\text{RPM}} \quad \text{Nm}$$

- 2) Determine mode of operation (Overrunning, Indexing, Backstopping).
- 3) Select & apply proper service factor from the table given below.
- 4) calculate design torque (multiply torque from Step 1 by Service Factor)
- 5) Determine bore requirement of clutch.
- 6) Determine overrunning speed & overrunning member (inner or outer race).
- 7) Select the clutch based upon:-
 - a) Design torque
 - b) Bore size
 - c) Mode of operation
 - d) Speed

SERVICE FACTORS

OVERRUNNING:

Type of Load	Service Factor
Gradually applied steady loads	1-1.25
Suddenly applied loads with minor shock	1.25-1.5
Suddenly applied Loads with heavy shock	2-3
Severe shock	4-6

BACKSTOPPING

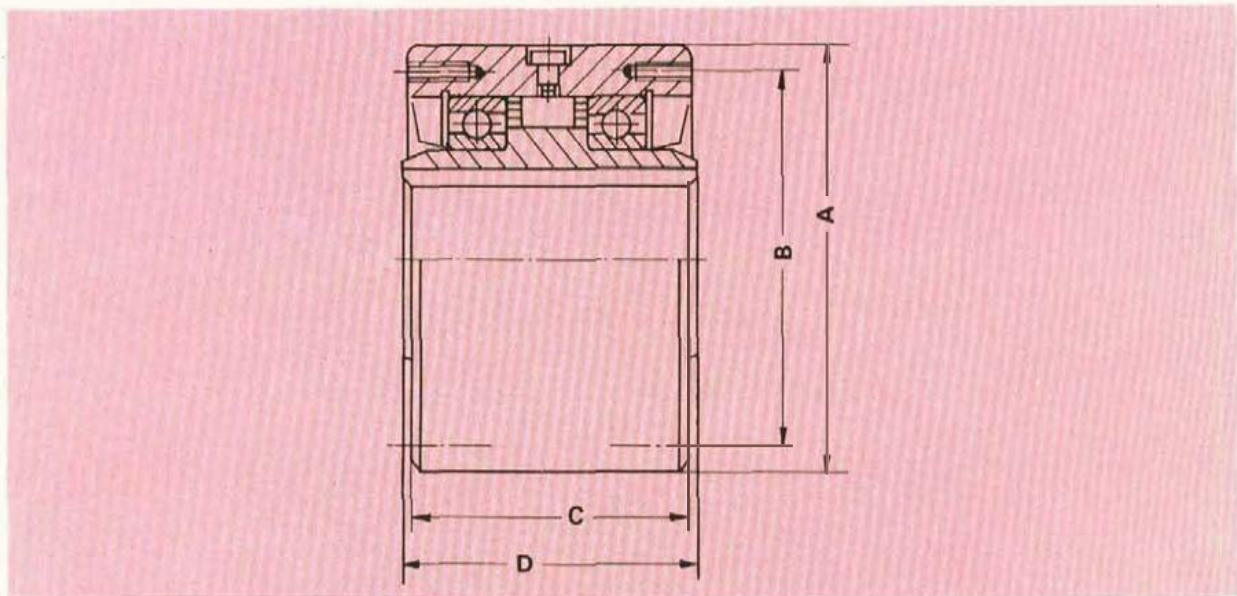
Type of Load	Service Factor
Occasional Loading	1-2
Frequent Loading	1.5-2.5

INDEXING

Type of Load	Service Factor
Less than 150 str./Min.	1.5-2
Over 150 Str./Min.	2-3

Sprag Clutch Type SF

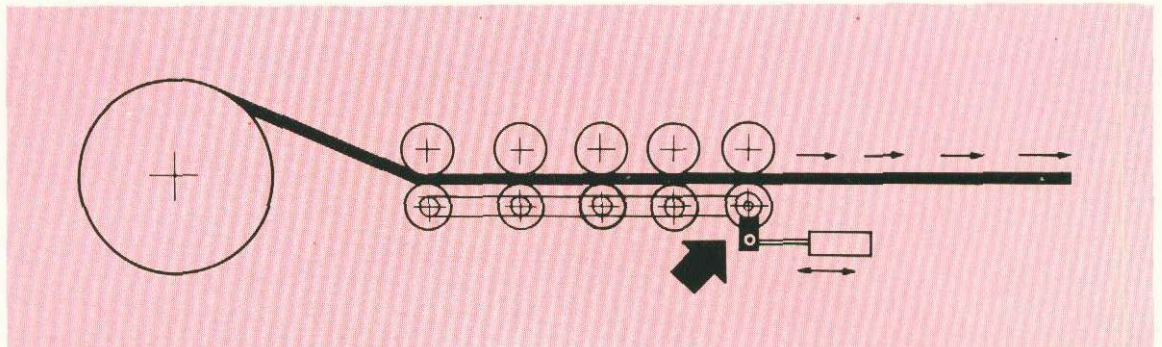
With Individually Spring Loaded Sprags



Model	Torque Nm	Maximum Overrunning RPM		Max. imum bore mm.	Keyway mm.	A mm.	B mm.	C mm.	D mm.	Nos.	Mounting Holes		Approx. Wt. Kg.
		Inner race	Outer race								Thread Size	Depth	
SF-300	210	2900	800	19.0	4.76×2.38	76.20 76.15	66.7	60.3	63.5	4	M8	13	1.5
SF-400	413	2700	800	22.2	4.76×2.38	86.90 88.85	73.0	66.7	69.9	4	M8	16	2.2
SF-500	1172	2400	750	33.2	6.33×2.38	107.95 107.90	92.1	85.7	88.9	4	M8	16	4.0
SF-600	2070	2100	700	50.8	12.7×4.76	136.53 136.47	120.7	92.9	95.3	6	M8	16	7.0
SF-700	5517	1500	500	74.5	15.8×3.16	180.92 180.89	158.6	123.8	127.0	6	M10	19	16.0
SF-750	9379	1500	500	87.3	19.5×4.76	222.22 ±0.025	177.8	149.2	152.4	6	M12	25.40	38.0
SF-800	15862	1300	475	112.7	25.4×6.35	253.98 ±0.025	227.0	149.2	152.4	8	M12	25.40	48.0
SF-900	22758	1200	400	136.1	25.4×6.35	304.76 ±0.038	247.65	158.7	161.9	10	M16	31.75	72.0
SF-1000	29655	1200	325	163.5	31.75×9.53	380.96 ±0.038	298.45	171.4	177.8	12	M16	31.75	115.0

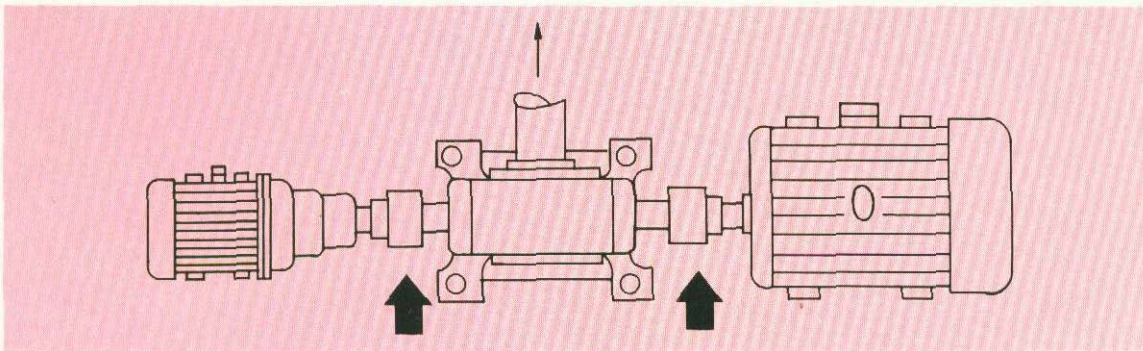
Applications:

INDEXING:



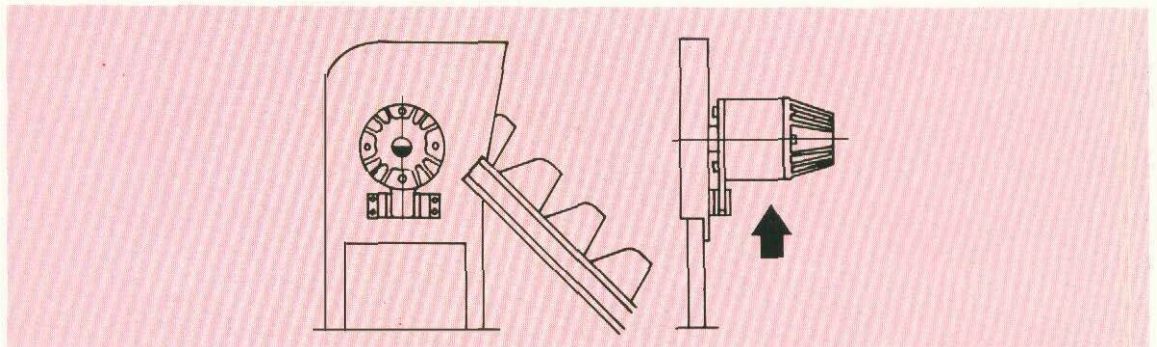
In this type of applications, reciprocating motion applied to the driving race of the clutch is transformed in to unidirectional intermittent motion at the driven race. Fig. 1 shows a typical Roll Feed mechanism for power presses. In this example reciprocating motion obtained by a pneumatic cylinder is applied to the outer race of the clutch, and infinite angular, intermittent unidirectional motion is available at feed roll.

OVERRUNNING:



Sprag clutches are capable of overrunning at either the inner or outer race. This application is mainly required in stand by drives and compound drives. Fig. 2 shows a dual speed drive. Here two prime movers are connected to the input shaft of a gearbox through sprag clutch-couplings.

BACKSTOPPING:



In Backstopping applications, sprag clutches are used to prevent reverse rotation of drive shafts. With the outer race of the clutch anchored to a stationary member, the inner race can overrun freely in one direction of rotation, reverse rotation is instantaneously prevented by the automatic engagement of the clutch. Fig. 3 shows a sprag clutch used as a Backstop on head shaft of a bucket elevator.

Our range of freewheel clutches cover a wide range of sizes and capacities which will handle the majority of industrial applications. However there are applications which require special designs to meet specialized requirements. We offer engineering assistance in both design and application in meeting these requirements. Please forward your application requirements to us.

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