RENOLD

Sprag Clutch

Overrunning - Indexing - Backstopping

2nd Edition

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RENOLD
Clutches & Couplings

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Worm, Helical and Bevel-Helical Speed Reducer Gear Units, Geared Motor Units and Fully Engineered Drive Packages.

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Contents

WITH HINDSIGHT YOU'D FIT RENOLD, WHY WAIT?

Renold's Quality is inherent across its range of power transmission products, allowing you to select for individual applications or combined engineered package solutions. Select Renold to keep your plant running and design options open.

RENOLD
The Power Transmission Solution

Renold Clutches & Couplings

RENOLD Gears was formed in 1964, a combination of John Holroyd & Co Ltd., of Milnrow and Croft Engineers Ltd of Bradford. Both companies had their origins in the 1880's and had been manufacturing gears and gear units of all kinds since the early 1900's.

The "Holroyd" wormgear tooth profile used exclusively in all **RENOLD** wormgears is based on BS.721 standard with special modifications to give a very high gear tooth efficiency and load carrying capacity.

RENOLD manufactures a comprehensive range of product comprising wormgear units, helical and bevel/helical gear units as speed reducer and motorised types.

All units have foot and shaft mounted options with modular build design to allow combination of many of the product types.

Service Excellence and Care

RENOLD offers a unique level of service excellence and customer care. Our experienced applications engineers will select the optimum solution, with the aid of the latest computer and design technology. **RENOLD** provides the service and care for peace of mind..

Special Solutions and Innovations

RENOLD Gears is recognised throughout the industry for its capability to create specific solutions to customer unique requirements, in a broad range of industries from food processing to escalators to textile machinery and general engineering.
Creating complete solutions, providing total capability in all market sectors not just for gear units, but also for complete drive packages.

Leading Edge Technology

Value through quality with continuous investment in people, process technology, manufacturing and commitment to quality, enables **RENOLD** to provide the practical cost effective solutions to most power transmission problems.

Consistent Reliability

RENOLD has years of experience in the design and manufacture of its products to the highest specifications, used in a numerous variety of industries throughout the world, with proven performance, guaranteed quality and assurance of reliability.

Package Solutions

One stop for your drive systems including gears, motors, couplings, variators and fabricated bases.

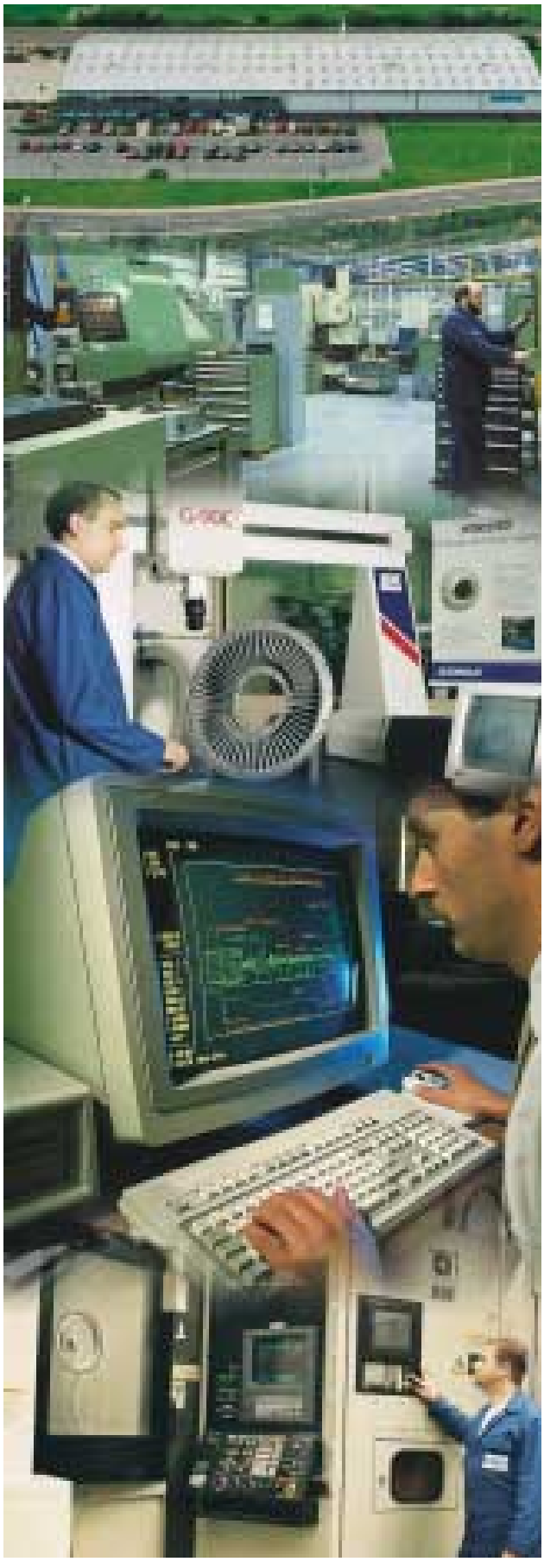
Approval

RENOLD Gears is BS EN ISO 9001:2000 approved. All products are designed and manufactured to this Quality Assurance System.

LRQA/880237

Local and International

The **RENOLD** organisation stretches worldwide with 16 National Sales Companies and more than 70 accredited distributors offering the comprehensive **RENOLD** range of power transmission products and service.



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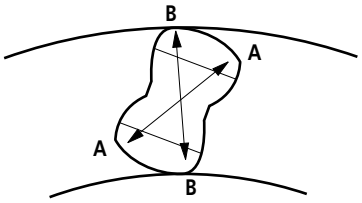
Sprag Clutch - General Specification

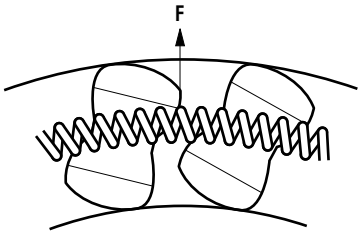
A Sprag Clutch is a free-wheel device having an inner race, and an outer race either of which can be the input or output member.

The input member can be arranged to drive the output member in a chosen direction and permit the output member to over-run in the same direction.

In general, Sprag Clutches are able to transmit greater torques, within given overall dimensions, than other types of free-wheel device.



In simple form the Sprag Clutch consists of a full complement of shaped steel sprags or wedges, located in the annular space between concentric inner and outer races. Power is transmitted from one race to the other by the wedging action of the sprags between them. Each sprag is so shaped that dimension AA is greater than BB. Rotation of one race in the 'driving' direction causes the sprags to tilt, thus transmitting the torque in full from one race to the other. Conversely rotation of the race in the other direction frees the sprags and permits over-running between the races.



A tilting force F keeps the sprags in light contact with both inner and outer races. There is thus no lost motion, the driving torque being instantaneously transmitted between races. Various spring arrangements are used to provide force F, a typical one being an expanding coil spring as shown in the diagram above. In any clutch of this type, the transmitting capacity must be dependent on the total load carrying area. The Renold Sprag Clutch is so designed that the maximum possible number of sprags can be accommodated; thus it will transmit a greater torque in relation to its size and weight than any other comparable type of clutch.

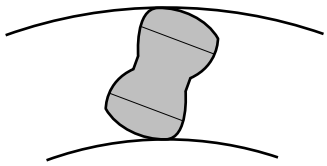
WARNING

If the clutch is used as the sole failsafe device in any application then other factors in the operating environment such as improper use, lack of servicing maintenance or lubrication may cause the clutch to fail causing danger to users, personnel and property.

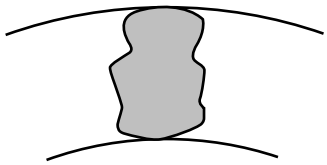
SO - SX Series

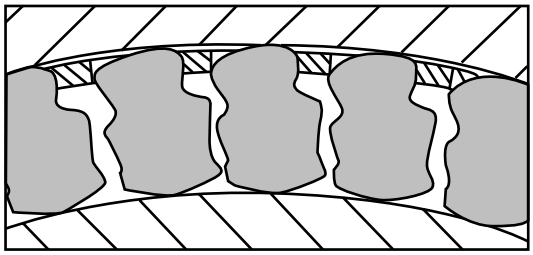
ARO sprags are fitted into the SO and SX series of sprag clutches up to size 700, and assist in resisting the effects of transient overloads and vibrations.

STANDARD SPRAG CLUTCH



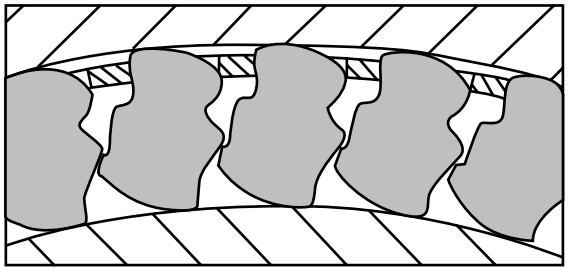
ARO SPRAG CLUTCH





Normal Engagement Condition:

Showing the ARO sprags in the drive locked position transmitting the rated torque of the particular clutch.

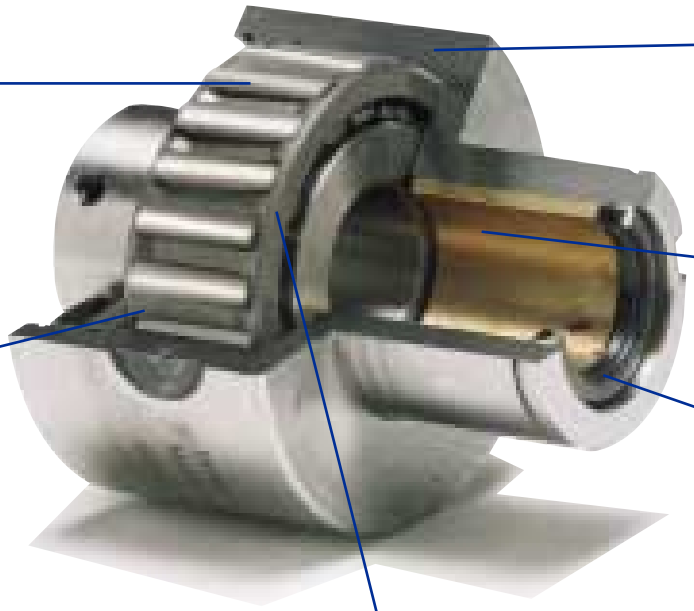


Extreme Overload Condition:

The projected shape at the side of each sprag creates a positive sprag-to-sprag abutment, which resists both rollover and popout.

Sprag Clutch - Product Features

Light Duty Sleeve Bearing Clutch



Hardened Sprag with a cam profile allowing for maximum torque transmission.

Hardened and ground outer race allowing for maximum power transmission with no loss of motion.

Bronze sleeve bearing combining concentricity and long life.

Free action retainer allows full positional control of the sprags for maximum load sharing capacity.

Oil seal for lubricant retention allowing minimum downtime.

Energising spring ensuring the Sprags are in full contact at any moment in time, eliminating all motion loss.

Ball bearing general and special purpose clutches

Anti roll over (ARO) hardened Sprags fitted to clutches up to size 700.

Heavy duty bearing fitted for maximum load capacity and long life.

Seal used for oil filled clutches or metal labyrinth plate fitted for grease filled clutches.

Alternative Labyrinth seal plate

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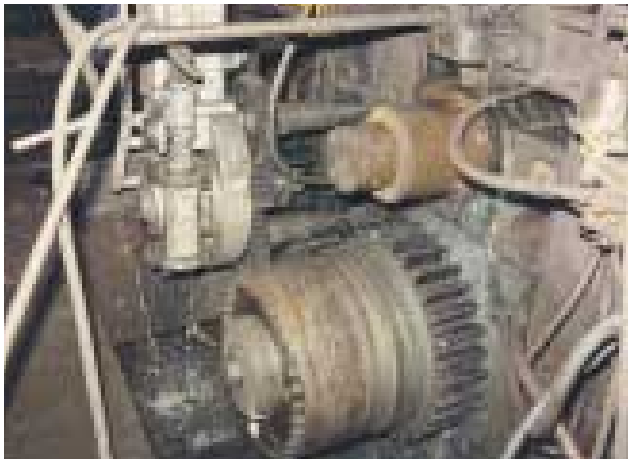
Sprag Clutch - Typical Applications



SO/SX sprag clutch used as an overrunning device on a nip roll in a steelwork rolling mill. Speed overrun is often created by the steel being rolled.

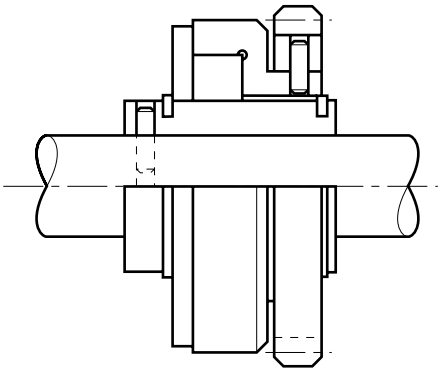
Sprag clutch holdbacks are often used on inclined conveyor headshaft drives to prevent runback in the event of a power failure.

Theme park rides are popular world wide, but safety is of major importance. Sprag clutches are used on the headshaft drive to prevent back-driving at all times during the ride.

SLH sprag clutch backstop on an apron feel conveyor in an iron ore mining plant in Canada.

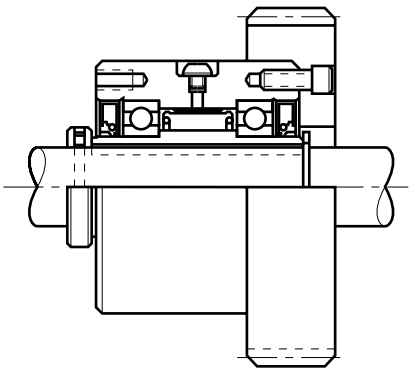
Mobile crane using a sprag clutch on the boom raise and lower mechanism, holding the weight of the boom against the diesel engine drive in the lowering motion preventing overspeeding.

Typical Sprag Clutch Mounting Arrangements



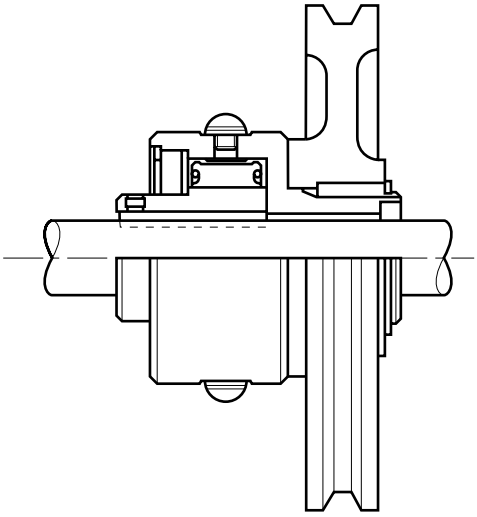
SA Series

Sleeve bearing clutch with gear mounted on outer race hub



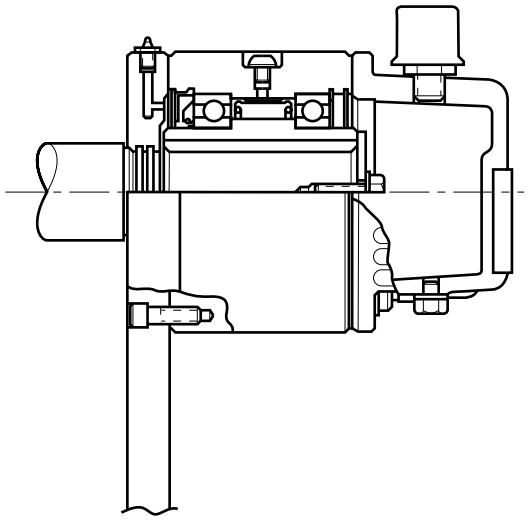
SO/SX Series

Ball bearing clutch with gear mounted and bolted to face of clutch.



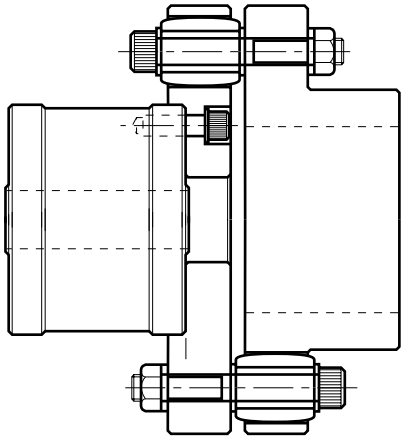
SB Series

Sleeve bearing clutch with sheave mounted on outer race hub.



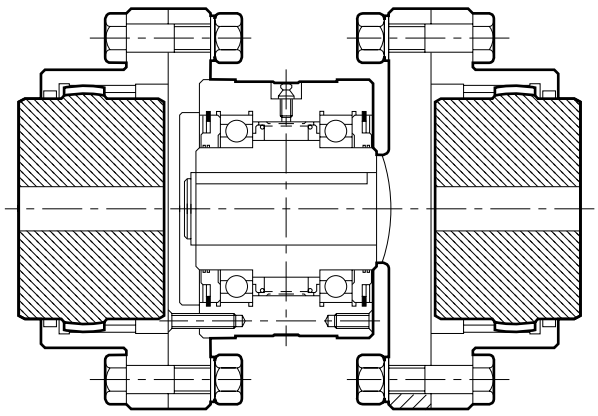
SO/SX Series

Clutch with reservoir, torque arm and auxiliary seal with bolt and retaining plate.



SCPF Series

Sprag clutch and Pinflex flexible coupling.



SCGF Series

Sprag clutch and Gearflex coupling combination.

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Sprag Clutch - Indexing and Over-running

SA Series Clutches

Max torque	41Nm - 30lb.ft.
Max bore	16mm - 0.625 ins.
Max overrunning speed	3450 RPM
Page No:	17

SB Series Clutches

Max torque	2170Nm - 1600lb.ft.
Max bore	50mm - 2.0 ins.
Max overrunning speed	1950 RPM
Page No:	19

SO/SX Series Clutches

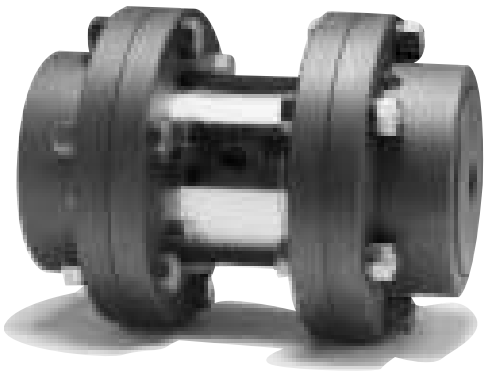
Max torque	36600Nm - 27000lb.ft.
Max bore	180mm - 7.0 ins.
Max overrunning speed	3600 RPM
Page No:	22

Flanged Stubshaft Adaptor

Max torque	36600Nm - 27000lb.ft.
Page No:	28

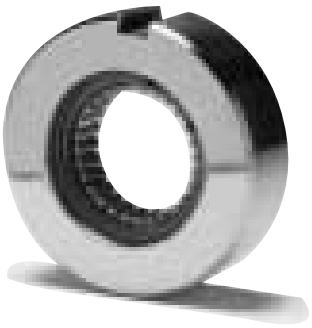
SCPF Series Coupling

Max torque	9660Nm - 7120 lb.ft.
Max bore	175mm - 6.875 ins.
Max overrunning speed	3600 RPM
Page No:	32



SCGF Series Coupling

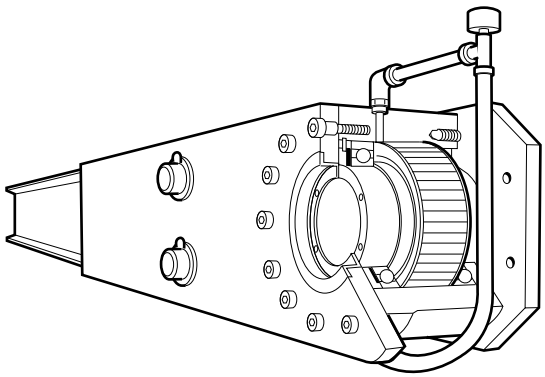
Max torque	9660Nm - 7120lb.ft.
Max bore	145mm - 5.7 ins.
Max overrunning speed	3600 RPM
Page No:	33



DM Series Clutches

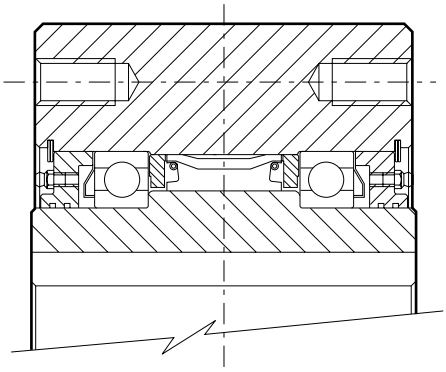
Max torque	3417Nm - 2520lb.ft.
Max shaft dia.	101.6mm - 4.0 ins.
Max overrunning speed	1800RPM
Page No:	34

Sprag Clutch - Backstops



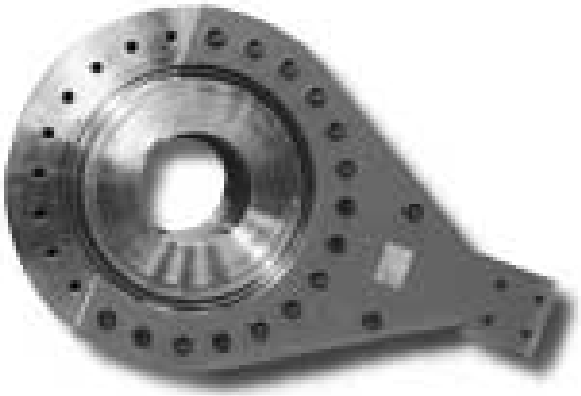
SH & SLH Holdbacks

Max torque 759300Nm - 560000lb.ft.
Max bore 500mm - 20.0 ins.
Page No: 40



Enhanced Seal Backstop

Max torque 759300Nm - 560000lb.ft.
Max bore 500mm - 20.0 ins.
Page No: 47



Special torque arm Backstop

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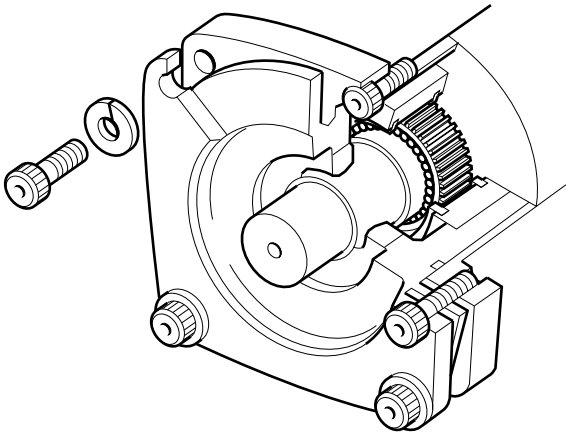

Tension Release Mechanisms

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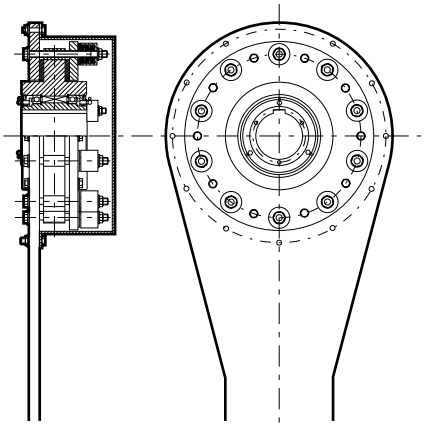

Torque limiter clutches

Max torque 759300Nm - 560000lb.ft.
Max bore 500mm - 20.0 ins.
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Sprag Clutch - Overrunning-Indexing-Backstopping

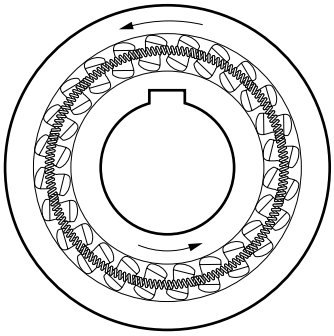
There are three basic applications for the sprag clutch.

- **Overrunning**
- **Indexing**
- **Backstopping or Holdback.**

In overrunning and backstopping applications, one race of the clutch is required to run at a faster speed than the other. It is suggested that the inner race is always the one that runs at high speed and the outer race at the lower speed.

Throughout this catalogue we show the maximum running speeds of both inner and outer races of all the Renold sprag clutch types.

OVERRUNNING

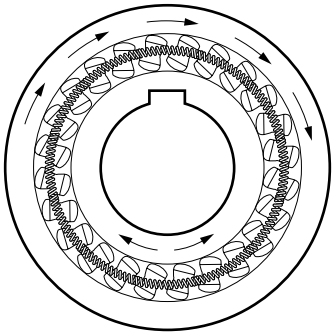


Overrunning applications often can be found in Barring drives or standby drives where two or more motors drive a machine. The high speed / high power drive being the prime mover, with a secondary drive at lower speed and power connected into the system to provide a slow speed drive for maintenance or other function.

Applications:

- Barring drives
- Multi point drives
- Fan drives

INDEXING



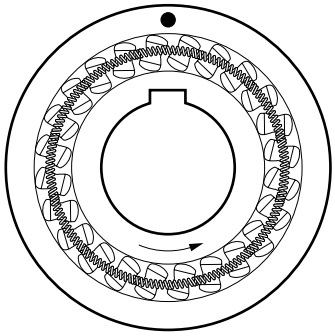
Indexing is an application where accuracy and consistancy is required.

By linking a reciprocating motion from the prime mover to one race of the sprag clutch the motion is converted to an indexing movement at the other race.

Applications:

- Assembly conveyors
- Packaging
- Food and drink
- Printing machines

BACKSTOPPING



Backstopping or holdback applications use a sprag clutch where the outer race is attached to the machine frame and the inner race is allowed to rotate in the forward direction. If the machine attempts to backdrive, the sprag clutch will prevent reverse rotation by acting as a holdback.

Applications:

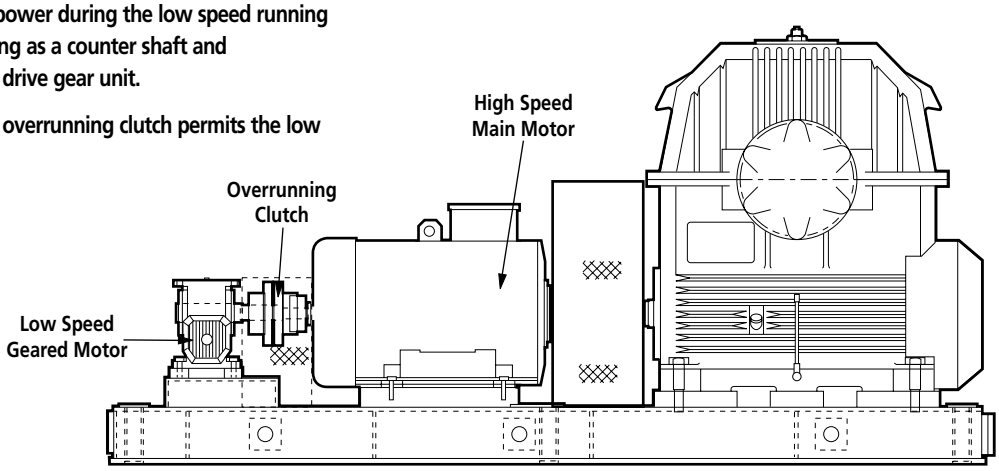
- Inclined conveyors
- Bucket elevators
- Fan drives
- Pumps

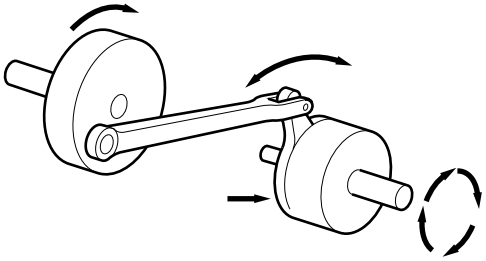
Sprag Clutch - Overrunning-Indexing-Backstopping

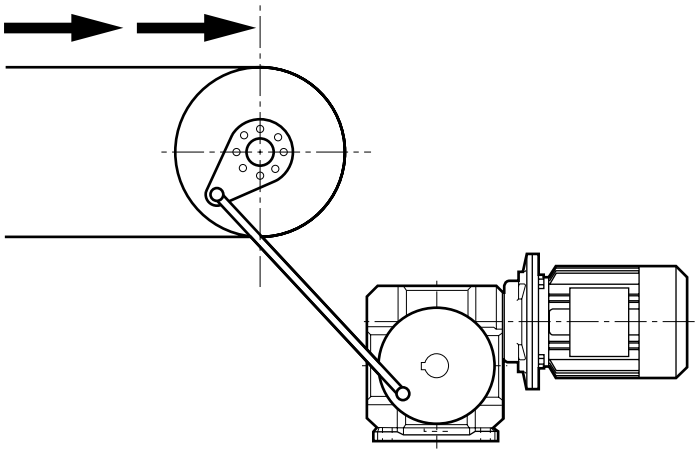
Overrunning

As shown, the clutch transmits power during the low speed running cycle, the high speed motor acting as a counter shaft and transmitting power to the main drive gear unit.

During the high speed cycle the overrunning clutch permits the low speed motor to be stationary.

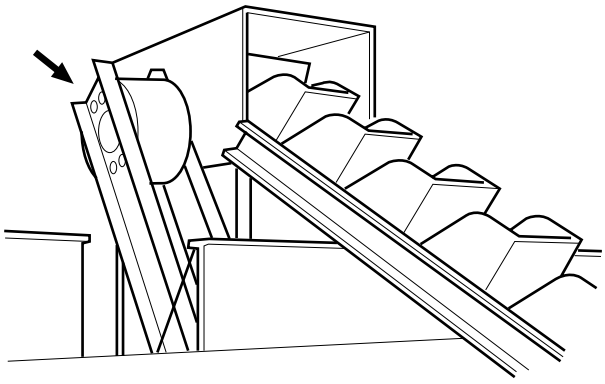






Indexing (inching)

The use of a Sprag Clutch enables indexing motion with accuracy - and infinite graduations - limited only by the precision of other components of the mechanism.



Backstopping (non-return)

A shaft in conjunction with one race can rotate freely in one direction but is prevented from reversing. The illustration shows a clutch fitted as a backstop to prevent run-back of an elevator.

Selection of Sprag Clutches

Selection of Sprag Clutches

The following notes are given for guidance in the selection of Sprag Clutches, but we strongly recommend that customers make use of the applicational knowledge and experience of our engineers before arriving at their final selection.

A sprag clutch must not be used in place of a flexible coupling.

Where it is desired to interpose a sprag clutch between separately supported shafts, a flexible coupling must also be used.

See page 30.

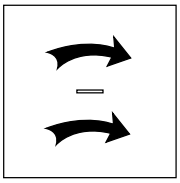
Vibrational Conditions

Sprag clutches will accept without detriment to their operation the vibrations which exist normally in most industrial machinery. However, there are certain situations where the torsional and/or the linear vibrations can be of such an order as to cause the clutch to malfunction; typically, where a diesel or petrol engine is the prime mover and there is no specially selected torsionally flexible coupling to smooth the vibration. In these circumstances, full details of the proposed design and all data related to any flexible elements should be submitted for consideration prior to finalisation of the selection.

Permissible Over-running Speeds

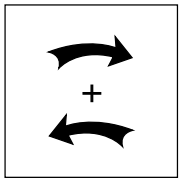
The permissible over-running speeds given in this catalogue for inner and outer races assume the other race to be stationary.

Same direction of rotation



If both races rotate in the same direction at different speeds, the overrunning speed is the difference in their speeds.

Opposite direction of rotation

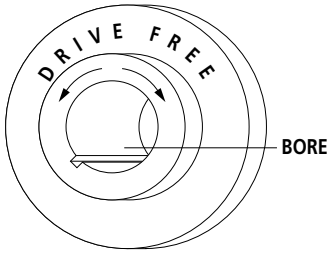


If the races rotate in opposite directions, the overrunning speed is the sum of their speeds.

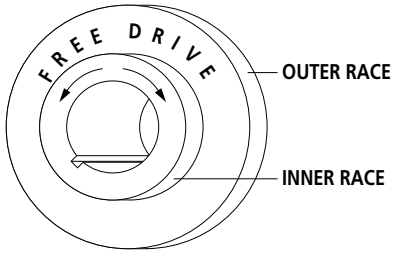
'Backlash'

Whilst there is no mechanical lost motion or 'backlash' in a Sprag Clutch, it should be appreciated that there will be some relative rotation between inner and outer races as a result of elastic deformation of component parts when subjected to torque loadings. This movement referred to as 'torque wind-up', may amount to between two and six degrees at nominal torque capacity and is smaller at lower torques.

CLUTCH HANDLING



LEFT HAND ROTATION SHOWN



RIGHT HAND ROTATION SHOWN

If the overrunning clutch design is not symmetrical, then the clutch rotation will need to be determined, and this information (RH or LH) must be provided at time of order.

To establish rotation of a clutch, look at the clutch from the end specified by the arrow for each clutch series. If the inner race drives the outer race in the clockwise direction it is a right hand rotation. For Clutch Couplings see page 30.

Selection of Sprag Clutches

To select a sprag clutch the following information must be known and, if we are to make the selection, should be submitted in full to our technical sales department, details at the base of this page.

- Type of prime mover - electric motor, IC engine, air motor etc.
- Clutch application - backstopping, overrunning or indexing.
- Torque to be transmitted.
- Maximum inner race overrunning speed.
- Maximum outer race overrunning speed.
- Shaft diameter or clutch bore size.
- Type of lubrication required.
- Ambient temperatures.

Duty

- The characteristics of the drive eg. degree of impulsiveness of the driven load.
- Duration of service in hours/day.
- Starting load (KW) and number of starts per day
- For intermittent duty, reversing or shock loading, state normal power (KW) and frequency

Service factors

Sprag clutches are used on many drive applications, the following tables show the service factors to be applied to the power or torque to be transmitted relative to the sprag clutch function - overrunning, indexing or backstopping.

Selection procedure

(1) Calculate torque transmitted through the clutch:-

$$\text{Torque (Nm)} = \frac{\text{KW} \times 9550}{\text{RPM}}$$

$$\text{Torque (lb.ft)} = \frac{\text{HP} \times 5250}{\text{RPM}}$$

(2) Select service factor from table 1 F_B for overrunning and backstopping
table 2 F_i for indexing

(3) Selection torque = Actual torque x Service factor (F_B or F_i)

(4) Select sprag clutch to suit selection torque (3). Ensure that selection will accept shaft diameters. If not, select next larger size clutch that will accommodate the shaft sizes and re check overrunning speed.

(5) For overrunning applications, check speed of overrunning member - inner or outer race, see notes on page 12.

(6) Select type of lubricant required to suit application.

(7) For clutch types SA, SB and clutch couplings SCPF and SCGF, the direction of rotation must be stated.

(8) Vertical and other special applications should be referred to Renold.

Over-running and backstopping

Table 1 Service Factor F_B

PRIME MOVER	Driven Machine Classification		
	Steady	Medium	Heavy
AC Motor, Air Motor Steam Turbine	1.25	1.5	2.5
Multi Cylinder IC Engine	1.75	Consult Renold	Consult Renold
Single Cylinder IC Engine, Diesel Engine	Consult Renold	Consult Renold	Consult Renold

Driven Machine Classification

Steady - Low starting torques and stead load.

Medium - Starting torques up to 2 x FLT with minor shock loading.

Heavy - High starting torques and severe shock loading.

For applications where vibrations are present it is necessary to increase the service factor or introduce vibration damping.

Consult Renold for more information.

Indexing

Table 2 Service Factor F_i

Type of Load	SA Series SB3 & 5	SB6 to SB16	SX400 to 700	SX750 to 1027
Less than 90° or less than 150 strokes/min	2 - 3	2	2	2
When angle is greater than 90° and over 100 strokes/min	3 - 4	2	2	2
Over 150 strokes/min. in any case	3 - 4	2	2	2

RENOLD

Sprag Clutch - Ratings Table

Clutch Reference	Maximum over-running Speed		Torque capacity	
	Inner race rpm	Outer race rpm	Nm	lb.ft.
SA Series - Light Duty Clutches				
SA02	3450	2400	6	4.5
SA04	3450	2400	23	17
SA05	1800	900	41	30
SB Series - Sleeve Bearing Clutches				
SB3	1950	900	54	40
SB5	1950	900	115	85
SB6	1950	750	372	275
SB8	1650	600	542	400
SB10	1250	350	881	650
SB12	1150	350	1760	1300
SB14	950	250	1970	1450
SB16	950	250	2170	1600
SO/SX Series - Over-running and Indexing Clutches				
SO/SX400	3000	600	407	300
SO/SX500	2500 (3000)*	800	1585	1168
SO/SX600	1200 (2000)*	750	3100	2285
SO/SX700	2000	450	6900	5086
SO/SX750	1425	650	9660	7120
SO/SX800	1250	525	17940	13223
SO/SX900	1350	500	24400	18000
SO/SX1000	1100	375	33900	24987
SO/SX1027	1100	375	36600	27000

*Grease lubricated clutches only.

Clutch Reference	Maximum continuous over-running speed inner race RPM	Torque capacity	
		Nm	lb.ft.
SH Series - Long Life Holdback Clutches			
SH700	400	5420	4000
SH750	380	9220	6800
SH800	300	15600	11513
SH900	250	24400**	18000**
SH1027	200	36600	27000
SH1051	200	61000	45000
SH1250	170	88100	65000
SH1300	140	122000	90000
SH1375	130	183000	135000
SH2000	100	271200	200000
SH2400	85	359300	265000
SH3500	80	508400	375000
SH5000	75	759300	560000

**20337 Nm for 130mm and greater
15000 lb.ft. for 5.25 and 5.437 ins bore

Clutch Reference	Maximum shaft over-running Speed RPM	Torque capacity	
		Nm	lb.ft.
Direct Mounting Clutch			
DM125	1800	143	105
DM150	1800	314	232
DM175	1500	427	315
DM200	1400	601	443
DM225	1200	739	545
DM250	1000	832	614
DM275	1000	966	712
DM300	900	1092	805
DM325	850	1677	1237
DM350	800	2262	1668
DM375	750	3086	2276
DM400	750	3417	2520
DM501	2400	51	38
DM502	2400	68	50
DM506	1800	158	117
DM507	1800	203	150
DM509	1800	339	250
DM510	1800	452	333
DM511	1800	678	500
DM512	1800	904	667
DM513	1200	1580	1177

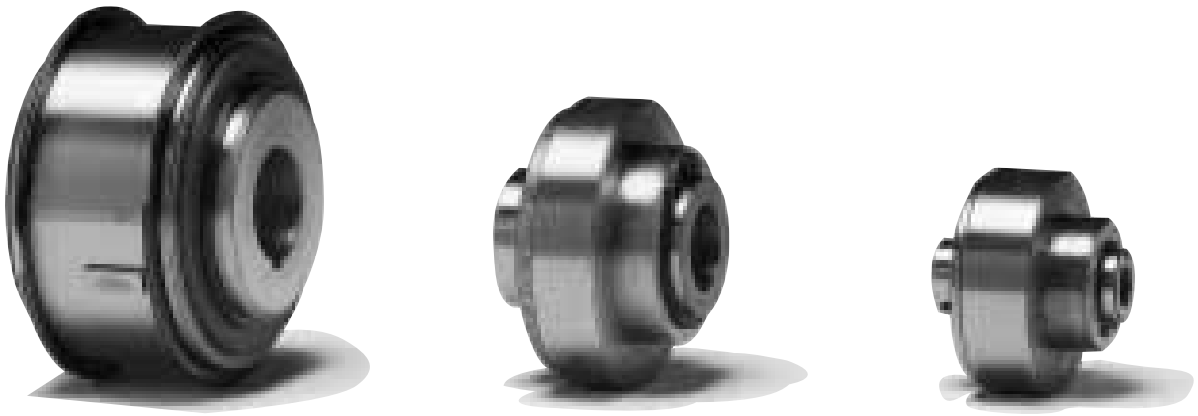
Pinflex - Sprag Clutch Coupling

Clutch Coupling Reference	Maximum Overrunning Speed		Maximum Drive Speed RPM	Torque Capacity	
	Inner Race RPM	Outer Race RPM		Nm	lb.ft.
SCPF 400	3600	850	5200	407	300
SCPF 500	3000	800	4400	1585	1168
SCPF 600	2400	750	3600	3100	2285
SCPF 700	2200	450	2900	6900	5086
SCPF 750	1800	650	2200	9660	7120

Gearflex - Sprag Clutch Coupling

Clutch Coupling Reference	Maximum Overrunning Speed		Maximum Drive Speed RPM	Torque Capacity	
	Inner Race RPM	Outer Race RPM		Nm	lb.ft.
SCGF 400	3600	850	5400	407	300
SCGF 500	3000	800	4800	1585	1168
SCGF 600	2400	750	4250	3100	2285
SCGF 700	2000	450	3600	6900	5086
SCGF 750	1800	650	3290	9660	7120

SA Series - Sprag Clutch - Size 02 to 05



The SA Series clutch is a light duty product with plain bearings.

Features:

- Suitable for all small machine applications where small compact dimensions are required.
- Grease lubricated and sealed for life, offering reliability with maintenance-free duty.
- Dimensional interchangeability with other leading manufacturers of clutches.
- SA 02 and SA 04 clutches supplied with driving pins, key not required.
- SA 05 clutches are supplied with Woodruff key and retaining rings. A parallel key (not supplied) is required for shaft connection.
- All SA Series clutches are handed, either left hand or right hand, making them suitable for all design options.

Applications:

- Light duty fans and blowers.
- Printing Machinery
- Textiles
- Instrumentation
- Light duty pumps
- Light duty general industrial applications.

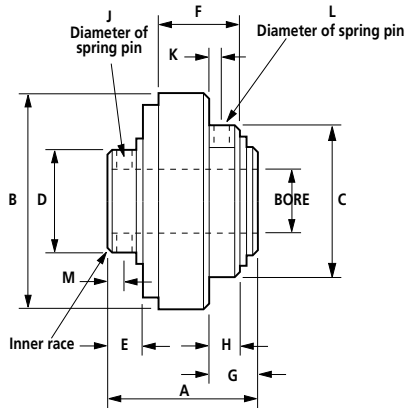
Overrunning - Indexing - Backstopping

RENOLD

SA Series - Sprag Clutch

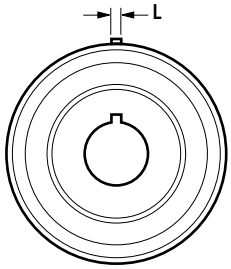
Light Duty Clutches are grease lubricated on assembly and do not require further lubrication in service.

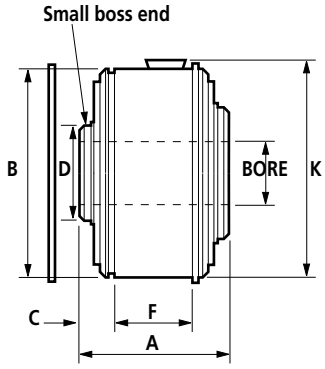
Clutches Ref SA 02/04



Clutches Ref SA 05

Woodruff key and retaining rings supplied. Parallel keys only must be used; under no circumstances are taper keys acceptable..





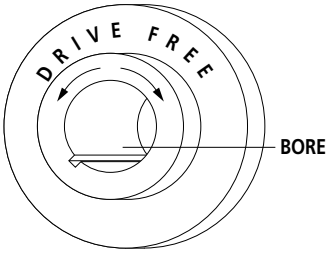
Sprag Clutch Reference	A mm in	B (max) mm in	B (min) mm in	C (max) mm in	C (min) mm in	D mm in	E mm in	F mm in	G mm in	H mm in	J mm in	K mm in	L mm in	M mm in
SA02	27.00	31.75	31.71	19.05	19.02	10.70	5.56	16.45	8.71	6.35	2.36	2.77	2.36	2.77
	1.06	1.250	1.249	0.750	0.749	0.42	0.22	0.648	0.343	0.25	0.93	0.11	0.93	0.109
SA04	28.60	41.28	41.24	28.58	28.55	20.10	7.14	15.86	9.12	6.35	3.18	2.39	3.18	3.18
	1.13	1.625	1.624	1.125	1.124	0.79	0.28	0.625	0.359	0.25	0.125	0.09	0.125	0.125
SA05	35.70	49.20	49.17	51.18	7.220	24.16	-	19.05	-	-	-	50.88	3.18	-
	1.40	1.937	1.936	2.015	0.284	0.95	-	0.750	-	-	-	2.003	0.125	-

SA Sprag Clutch Reference	Torque Capacity Nm lb ft	Maximum O'running Speed Inner Race rpm	Outer Race rpm	Resistance After Run-in Nm lb ft	Standard Bore Sizes mm in	mm in	Key Size mm in	Weight Approx kg lb
SA02	6	3450	2400	0.04	6 (H8)	-	-	0.08
	4.5			0.03	0.250 (H8)	-	0.187	
SA04	23	2800	2400	0.04	10 (H8)	12 (H8)	-	0.14
	17			0.03	0.375 (H8)	0.500 (H8)	-	0.312
SA05	41	1800	900	0.07	16 (H7)	14 (H7)	4 x 4	0.37
	30			0.05	0.625 (H7)	-	1/8 x 1/8	0.812

Clutch Handling

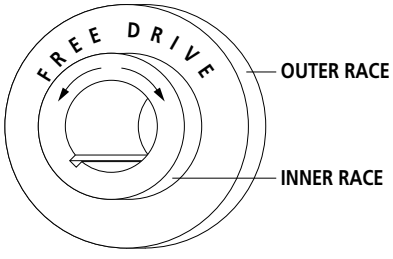
SA Series

LH Clutches - Inner race drives anti-clockwise when viewed from small boss or inner race end.



LEFT HAND ROTATION SHOWN

RH Clutches - Inner race drives clockwise when viewed from small boss or inner race end.



RIGHT HAND ROTATION SHOWN

ORDERING INFORMATION

Clutch Reference	Part Number	
	Left Hand	Right Hand
SA02	648000	648001
SA04	648002	648003
SA05	648100	648101

When ordering please specify clutch reference or part number eg. SA04/12mm or 648002/0012.

SB Series - Sprag Clutch - Sizes 3 to 16

A general purpose clutch suitable for most general light to medium duty applications.

Features:

- Extended spigot at one side to allow direct mounting of chain pinions gears, index arms etc., for design flexibility.
- A sleeve bearing inside the extended spigot gives greater support, thus adding strength and robustness.
- Dimensionally identical to other manufacturers, giving interchangeability.
- SB3 clutches are supplied greased and sealed for life, therefore no maintenance is required.
- SB5 to SB16 clutches can supplied suitable for oil or grease lubrication or without seals for use in oil bath applications.
- All SB Series clutches are handed, either left or right hand.

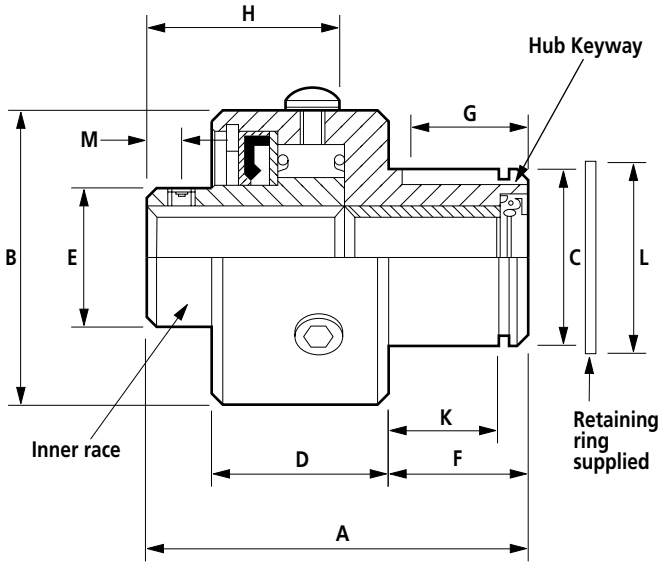
Applications:

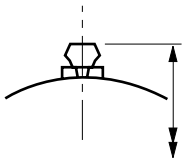
- Centrifugal pumps
- Textile Machinery
- Instrumentation
- Mixer Drives
- Blowers and fan drives
- Light duty general industrial applications

Overrunning - Indexing - Backstopping

RENOLD

SB Series - Sprag Clutch





For all clutches other than SB3 add 16mm to dimension B for clearance dia over grease nipples/oil plugs.

INNER RACE
Bore and Key Size

Clutch Ref	Metric range		Inch range	
	Bore	Key	Bore	Key
SB3	10H7	*	0.375(H7)	*
			0.500(H7)	*
SB5	16H7	5 x 5	0.500(H7)	1/8 x 1/8
			0.625(H7)	3/16 x 3/16
SB6	18H7	6 x 6	0.750(H7)	3/16 x 3/16
SB8	25H7	8 x 7	0.875(H7)	1/4 x 1/4
			1.000(H7)	1/4 x 1/4
SB10	30H7	8 x 7	1.125(H7)	5/16 x 5/16
	32H7	10 x 8	1.250(H7)	5/16 x 5/16
SB12	28H7	8 x 7	1.375(H7)	5/16 x 5/16
	38H7	10 x 8	1.500(H7)	3/8 x 3/8
SB14	38H7	10 x 8	1.625(H7)	7/16 x 7/16
	45H7	14 x 9	1.750(H7)	7/16 x 7/16
SB16	50H7	14 x 9	1.875(H7)	1/2 x 1/2
			2.000(H7)	1/2 x 1/2

Sprag Clutch Reference	A mm / in	B mm / in	C (max) mm / in	C (min) mm / in	D mm / in	E mm / in	F mm / in	G mm / in	H mm / in	K (min) mm / in	L mm / in	M mm / in	Hub Key Size
SB3	47.62	41.27	22.23	22.20	17.46	20.09	20.64	12.70	23.80	16.74	25.73	5.54	-
	1.88	1.63	0.875	0.874	0.69	0.79	0.81	0.50	0.94	0.66	1.00	0.22	1/8 x 1/8
SB5	69.85	50.80	31.75	31.72	31.75	25.40	25.40	14.27	41.27	21.13	36.27	6.35	-
	2.75	2.00	1.250	1.249	1.25	1.00	1.00	0.56	1.63	0.83	1.43	0.25	3/16 x 3/16
SB6	80.95	73.03	34.93	34.90	39.67	35.00	33.32	23.80	42.85	29.13	39.95	4.75	-
	3.19	2.88	1.375	1.374	1.56	1.38	1.31	0.94	1.69	1.15	1.57	0.18	3/16 x 3/16
SB8	90.22	82.55	44.45	44.42	47.60	41.27	36.50	24.50	47.62	31.47	50.65	5.54	-
	3.55	3.25	1.750	1.749	1.87	1.62	1.44	0.96	1.88	1.24	2.00	0.22	1/4 x 1/4
SB10	88.90	95.25	57.15	57.12	44.45	51.59	36.50	23.80	46.02	32.11	63.35	6.35	-
	3.50	3.75	2.250	2.249	1.75	2.03	1.44	0.94	1.81	1.26	2.50	0.25	5/16 x 5/16
SB12	98.42	112.71	63.50	63.47	52.40	60.33	36.50	30.15	53.97	30.61	73.30	7.14	-
	3.87	4.44	2.500	2.499	2.06	2.38	1.44	1.19	2.13	1.21	2.89	0.28	3/8 x 3/8
SB14	111.18	139.70	73.03	73.00	55.56	76.20	44.45	34.14	57.15	39.34	81.81	7.92	-
	4.38	5.50	2.875	2.874	2.19	3.00	1.75	1.34	2.25	1.55	3.22	0.31	7/16 x 7/16
SB16	111.18	139.70	82.55	82.52	55.56	76.20	44.45	36.50	57.15	39.67	91.85	7.95	-
	4.38	5.50	3.250	3.249	2.19	3.00	1.75	1.44	2.25	1.56	3.62	0.31	1/2 x 1/2

Clutches Ref SB5-16 are available for either oil or grease lubrication; for applications where the clutch will run immersed in oil, it can be supplied without seals. SB3 is supplied greased for life.

Parallel keys only must be used: under no circumstances are taper keys acceptable.

* 4.78mm (0.187 ins) spring pin supplied loose.

Concentricity

Concentricity of the sprag tracks of Sleeve Bearing Clutches is achieved by using the shaft on which the clutch is mounted as a bearing surface. The surface finish should not exceed 30 micro inch CLA and taper should not exceed 0.01mm per 25mm of journal length.

Standard bore limits are H8 for all light duty clutches. Recommend shaft limits are H6.

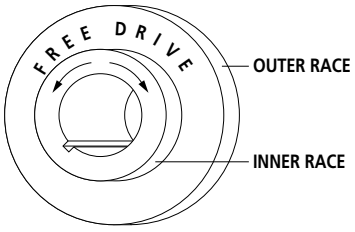
SB Series - Sprag Clutch

SB Sprag Clutch Size	Torque Capacity Nm / lb ft	Maximum O'running Speed Inner Race rpm	Maximum O'running Speed Outer Race rpm	Resistance After Run-in Nm / lb ft	Oil or Grease Capacity ml / oz	Weight Approx kg / lb
SB3	54 40	1950	900	0.27 0.2	Greased For Life	0.28 0.62
SB5	115 85	1950	900	0.68 0.5	7.1 0.25	0.6 1.32
SB6	372 275	1950	750	2.28 1.68	10.6 0.38	1.36 3.00
SB8	542 400	1650	600	3.8 2.8	14.2 0.50	1.93 4.25
SB10	881 650	1250	350	4.75 3.5	14.2 0.50	2.44 5.38
SB12	1760 1300	1150	350	7.9 5.84	21.3 0.75	3.91 8.62
SB14	1970 1450	950	250	9.3 6.87	28.4 1.00	6.32 13.90
SB16	2170 1600	950	250	9.3 6.87	28.4 1.00	6.35 14.00

CLUTCH HANDLING

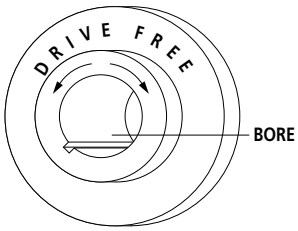
SB Series

RH Clutches - Inner race drives clockwise when viewed from small boss or inner race end.



RIGHT HAND ROTATION SHOWN

LH Clutches - Inner race drives anti-clockwise when viewed from small boss or inner race end.



LEFT HAND ROTATION SHOWN

ORDERING INFORMATION

Clutch Reference	Part Numbers					
	Left Hand Clutches			Right Hand Clutches		
	Grease lubricated	Oil lubricated	Without seal	Grease lubricated	Oil lubricated	Without seal
SB3	648 104	-	-	648 105	-	-
SB5	648 206	648 106	648 108	648 207	648 107	648 109
SB6	648 210	648 110	648 112	648 211	648 111	648 113
SB8	648 214	648 114	648 116	648 215	648 115	648 117
SB10	648 218	648 118	648 120	648 219	648 119	648 121
SB12	648 222	648 122	648 124	648 223	648 123	648 125
SB14	648 226	648 126	648 128	648 227	648 127	648 129
SB16	648 230	648 130	648 132	648 231	648 131	648 133

When ordering please specify clutch reference/part number and bore size required e.g. SB6 LH/0.75" or 648210/0750.

IMPORTANT

The clutch must fit on a shaft with a recommended diameter tolerance of h6 for metric and inch shafts and to the USA shaft tolerance figures on page 50.

IMPORTANT

Note that it is essential that the shaft keyway does not extend into the sleeve bearing as excessive wear could be created and result in failure of the clutch.

RENOLD

SO/SX Series - Sprag Clutch - Sizes 400 to 1027

A high precision, clutch suitable for medium to heavy duty applications.

Features:

- All clutches are fitted with high precision heavy duty bearings for arduous duty applications.
- Clutch sizes 300 to 700 are fitted with ARO sprags to resist vibration and high transient torques and overloads.
- SO series clutches, oil lubricated suitable for overrunning, backstopping and medium duty indexing (up to 150 indexed/minute).
- Grease lubrication is available where high inner race overrunning speeds are required or maintenance is difficult.
- SO series clutches, grease lubricated for use on general purpose overrunning and backstopping applications.
- SX series clutches, oil lubricated designed for medium to heavy indexing applications (over 150 indexes/minute).

Applications:

- Pump drives
- Paper Machinery
- Textile Machinery
- Light duty hammer mills
- Fan Drives
- General industrial applications

Overrunning - Indexing - Backstopping

SO/SX Series - Sprag Clutch - General Specification

SO / SX Series Sizes 300 to 700

Overrunning / Indexing / Backstopping

This range of sprag clutches are fitted with ball bearings to ensure concentricity and carry radial and axial loads. From size 400 to 700 the clutches have cage mounted ARO sprags which are specifically designed to resist the effects of vibration, high transient torque and overloads. Outer race end faces have tapped holes for the attachment of items such as couplings, sprockets, pulleys etc. with the outside diameter of the outer race providing location to ensure concentricity. The clutch must be mounted on a shaft with the inner race driven by a parallel key with top clearance (taper keys must never be used). Please see page 44-45 for bore and keyway sizes and recommended shaft diameters. Grease lubrication should be used where maintenance is likely to be infrequent or where high inner race overrunning speeds are required.

SO Series - Oil Lubricated

General purpose sprag clutches for overrunning, backstopping and light to medium duty indexing applications (up to 150 indexes per minute). Fitted with lip type seals, for oil retention and protection in hostile environments.

SO Series - Grease Lubricated

General purpose sprag clutches incorporating Labyrinth seals for use in overrunning and backstopping applications. Labyrinth seals allow higher overrunning speeds.
End face lubrication option is available on many clutch sizes for use in general industrial applications and with the tension release mechanisms.

SX Series - Oil Lubricated

Indexing sprag clutches specifically designed for medium to heavy duty indexing applications (over 150 indexes per min). Grease lubrication option is available.

SO / SX Series Sizes 750 to 1027

Overrunning / Indexing / Backstopping

SO Series - Oil Lubricated
SO Series - Grease Lubricated
SX Series - Oil Lubricated
The SO / SX Series sprag clutches sizes 750 to 1027 offers many of the features of the 300 to 700 sizes and should be used in the same applications where torque and speed permits.

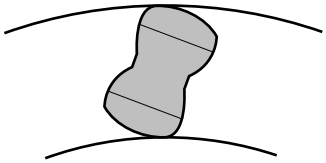
WARNING

If the clutch is used as the sole failsafe device in any application then other factors in the operating environment such as improper use, lack of servicing maintenance or lubrication may cause the clutch to fail causing danger to users, personnel and property.

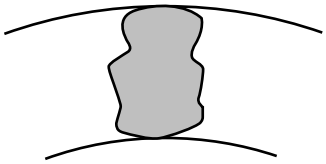
SO - SX Series

ARO sprags are fitted into the SO and SX series of sprag clutches up to size 700, and assist in resisting the effects of transient overloads and vibrations.

STANDARD SPRAG CLUTCH

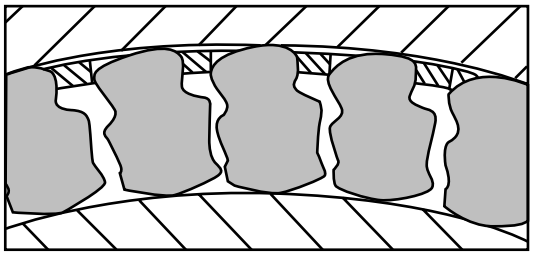


ARO SPRAG CLUTCH



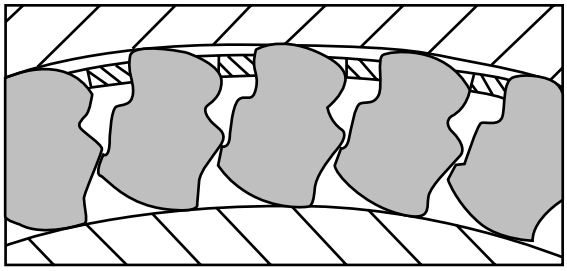
Normal Engagement Condition:

Showing the ARO sprags in the drive locked position transmitting the rated torque of the particular clutch.



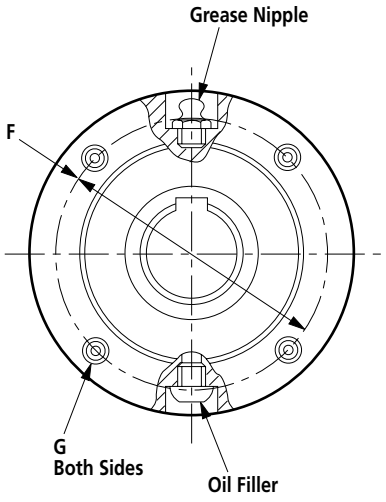
Extreme Overload Condition:

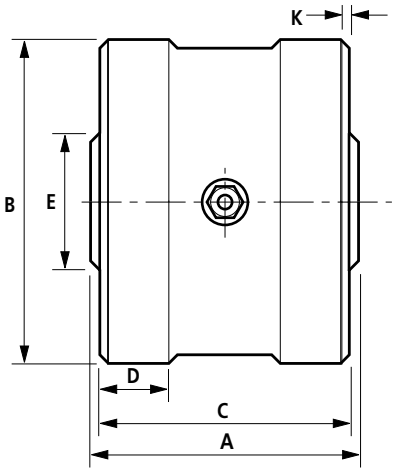
The projected shape at the side of each sprag creates a positive sprag-to-sprag abutment, which assists both rollover and popout.

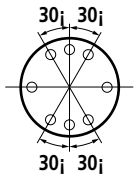


RENOLD

SO/SX Series - Sprag Clutches - Sizes 300 to 700





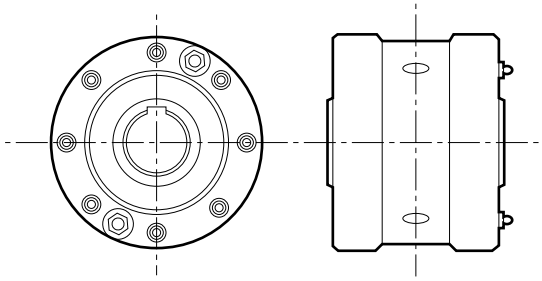


##Hole spacing - SO700
All other clutches
holes equally spaced.

Parallel Keys only must be used, under no circumstances are taper keys acceptable.

Sprag Clutch Reference	A mm in	B (max) mm in	B (min) mm in	C mm in	D mm in	E mm in	F mm in	G Number of Holes	G Thread U.N.F.	G Depth mm Depth in	K mm in	Weight kg lb
300	63.5	76.20	76.15	60.45	-	28.58	66.67			12.7	1.5	1.6
	2.50	3.000	2.998	2.38	-	1.12	2.625	4@90°	0.250	0.500	0.06	3.5
400	69.85	88.900	88.849	68.28	12.70	30.16	73.025			16	1.5	2.7
	2.75	3.500	3.498	2.69	0.50	1.19	2.875	4@90°	0.3125	0.625	0.06	6.0
500	88.90	107.950	107.899	85.73	15.88	44.45	92.075			19	1.5	4.8
	3.50	4.250	4.248	3.38	0.63	1.75	3.625	4@90°	0.3125	0.75	0.06	10.5
600	95.25	136.525	136.474	92.08	19.05	63.50	120.650			19	1.5	8.6
	3.75	5.375	5.373	3.63	0.75	2.50	4.750	6@60°	0.3125	0.75	0.06	19.0
700	127.00	180.975	180.924	123.83	25.40	88.90	158.750			19	1.5	19.0
	5.00	7.125	7.123	4.88	1.00	3.50	6.250	8##	0.375	0.75	0.06	42.0

SO or SX Sprag Clutch Reference	Torque Capacity Nm lb ft	Maximum Over Running Speed Lip Seal - Oil Lube Inner Race rpm	Lip Seal - Oil Lube Outer Race rpm	Labyrinth Seal - Grease Inner Race rpm	Labyrinth Seal - Grease Outer Race rpm	Max Bore mm in	Resistance After Run-in Nm lb ft
300	379	3000	900	3600	900	20	0.18
	275					0.750	0.13
400	407	2800	850	3600	850	22	0.27
	300					0.875	0.20
500	1585	2500	800	3000	800	32	0.31
	1168					1.312	0.23
600	3100	2200	750	2400	750	50	0.62
	2285					2.000	0.46
700	6900	1600	450	2000	450	70	1.56
	5086					2.937	1.15



Clutch Sizes 600 and 700 are available with end face lubrication

IMPORTANT

The clutch must run on a shaft with a recommended diameter tolerance of h6 for metric and inch shafts and to the USA shaft tolerance figures on page 50.

WARNING

The clutch must be mounted on a shaft with the inner race driven by a parallel key with top clearance. TAPER KEYS MUST NEVER BE USED.

SO/SX Series - Sprag Clutches - Sizes 300 to 700

Bore Sizes

Sprag Clutch Reference	British Inch Sizes Bore H7 (in)	British Inch Sizes Keyway# W x D (in)	Metric Sizes Bore H7 (mm)	Metric Sizes Keyway# W x D (mm)	USA Inch Sizes $ Bore (in)	USA Inch Sizes $ Keyseat W x D (in)
	0.4375	0.094 x 0.047			0.4375	0.094 x 0.047
	0.500	0.125 x 0.062	16	5 x 2.5	0.500	0.125 x 0.062
300	0.625	0.188 x 0.094	18	6 x 3	0.625	0.188 x 0.094
	0.750	0.188 x 0.094	20	6 x 3	0.750	0.188 x 0.094
	0.500	0.125 x 0.063	14	5 x 2.5	0.4375	0.094 x 0.047
	0.625	0.187 x 0.094	16	5 x 2.5	0.500	0.125 x 0.062
400	0.750	0.187 x 0.094	18	6 x 3	0.625	0.188 x 0.094
	0.875	0.187 x 0.094	20	6 x 3	0.750	0.188 x 0.094
			22	6 x 1.7	0.875	0.188 x 0.062
	0.750	0.187 x 0.094	22	6 x 3	0.750	0.188 x 0.094
	0.875	0.187 x 0.094	24	8 x 3.5	0.875	0.188 x 0.094
500	1.000	0.250 x 0.125	25	8 x 3.5	1.000	0.250 x 0.125
	1.125	0.250 x 0.125	28	8 x 3.5	1.125	0.250 x 0.125
	1.250	0.250 x 0.125	30	8 x 3.5	1.250	0.250 x 0.125
	1.312	0.250 x 0.088	32	10 x 3.2	1.3125	0.250 x 0.094
	1.125	0.250 x 0.125	30	8 x 3.5	1.250	0.250 x 0.125
	1.250	0.250 x 0.125	32	10 x 4	1.375	0.375 x 0.188
	1.375	0.375 x 0.188	35	10 x 4	1.4375	0.375 x 0.188
600	1.500	0.375 x 0.188	38	10 x 4	1.500	0.375 x 0.188
	1.625	0.375 x 0.188	40	12 x 4	1.625	0.375 x 0.188
	1.750	0.375x 0.188	45	14 x 3.8	1.750	0.375 x 0.188
	1.875	0.500 x 0.156	48	14 x 4.5	1.875	0.375 x 0.188
	2.000	0.500 x 0.156	50	14 x 3.5	1.9375	0.375 x 0.188
					2.000	0.375 x 0.125*
	1.9375	0.500 x 0.250	50	14 x 4.3	1.875	0.375 x 0.188
	2.000	0.500 x 0.250	55	16 x 4.6	1.9375	0.500 x 0.250
	2.250	0.625 x 0.313	60	18 x 5.4	2.000	0.500 x 0.250
	2.375	0.625 x 0.313	65	18 x 5.4	2.125	0.500 x 0.250
	2.4375	0.625 x 0.219	70	20 x 4.8	2.250	0.500 x 0.250
700	2.500	0.625 x 0.313			2.375	0.625 x 0.313
	2.750	0.625 x 0.219			2.4375	0.625 x 0.313**
	2.9375	0.625 x 0.172			2.500	0.625 x 0.313
					2.625	0.625 x 0.250
					2.750	0.625 x 0.219
					2.9375	0.625 x 0.125

ORDERING INFORMATION

Clutch Reference	Part Numbers Grease lubricated	Oil lubricated	Without seal
OVERRUNNING			
SO300	6481301	6481302	6481303
SO400	6481401	6481402	6481403
SO500	6481501	6481502	6481503
SO600	6481601	6481602	6481603
SO700	6481701	6481702	6481703
INDEXING			
SX300	6482301	6482302	6482303
SX400	6482401	6482402	6482403
SX500	6482501	6482502	6482503
SX600	6482601	6482602	6482603
SX700	6482701	6482702	6482703

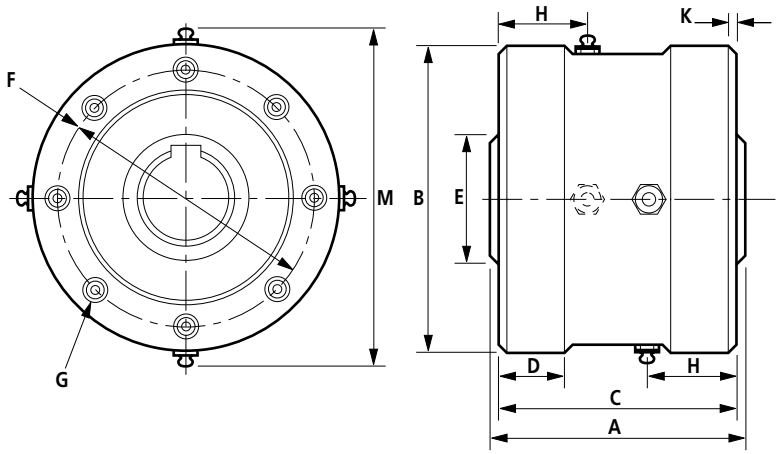
For British inch and metric sizes, recommend shaft tolerances are 'h6'.
$ For American Inch sizes, suffix bore 'A', see table on page 50 for bore and recommended shaft tolerances.
All keys must be parallel with top clearance - never use taper keys.
All keyway/keyseat depths are measured at side.
* SO / SX 600 Alternative keyseat 0.500" x 0.250"
** SO / SX 700 Alternative keyseat 0.500" x 0.250"

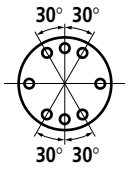
When ordering please specify clutch reference/part number, bore size required and keyway required if non standard.

eg. SO600/1.375" or6481602/1.375 (suffix 'A' if American)

RENOLD

SO/SX Series - Sprag Clutches - Sizes 750 to 1027





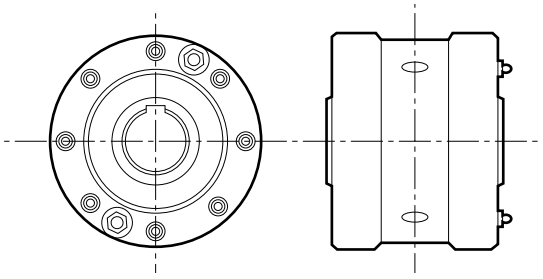
##Hole spacing - SO 750
All other clutches
holes equally spaced.

Parallel keys only must be used, under no circumstances are taper keys acceptable.

Sprag Clutch Reference	A mm / in	B (max) mm / in	B (min) mm / in	C mm / in	D mm / in	E mm / in	F mm / in	Number of Holes	G Thread U.N.F.	Depth mm Depth in	H mm / in	K mm / in	Weight kg / lbs
750	152.40 / 6.00	222.25 / 8.750	222.20 / 8.748	149.22 / 5.88	31.75 / 1.25	107.95 / 4.25	177.80 / 7.00	8 # #	0.5	25.4 / 1.00	49 / 1.94	1.5	38 / 83
800	152.40 / 6.00	254.00 / 10.00	253.95 / 9.998	149.22 / 5.88	31.75 / 1.25	139.70 / 5.50	227.01 / 8.94	8 @ 45°	0.5	25.4 / 1.00	49 / 1.94	1.5	46 / 102
900	161.90 / 6.38	304.80 / 12.000	307.72 / 11.997	158.75 / 6.25	34.93 / 1.38	161.93 / 6.38	247.65 / 9.75	10 @ 36°	0.625	31.75 / 1.25	54 / 2.13	1.5	71 / 156
1000	177.8 / 7.00	381.00 / 15.000	380.92 / 14.997	171.45 / 6.75	34.93 / 1.38	193.68 / 7.63	298.45 / 11.75	12 @ 30°	0.625	31.75 / 1.25	60 / 2.38	1.5	115 / 253
1027	168.30 / 6.63	381.00 / 15.000	380.92 / 14.997	165.10 / 6.50	34.93 / 1.38	228.60 / 9.00	298.45 / 11.75	12 @ 30°	0.625	25.4 / 1.00	54 / 2.13	1.5	114 / 250

SO or SX Sprag Clutch Reference	Torque Capacity Nm / lb ft	Maximum Over Running Speed — Lip Seal - Oil Lube: Inner Race rpm	Lip Seal - Oil Lube: Outer Race rpm	Labyrinth Seal - Grease: Inner Race rpm	Labyrinth Seal - Grease: Outer Race rpm	Max Bore mm / in	Resistance After Run-in Nm / lb ft
750	9660 / 7120	1000	650	1800	650	80 / 3.250*	5.08 / 3.75
800	17940 / 13223	850	525	1500	525	110 / 4.250	7.12 / 5.25
900	24400* / 18000*	700	500	1350	500	130 / 5.437*	8.47 / 6.25
1000	33900 / 24987	500	375	1100	375	160 / 6.438	13.56 / 10.00
1027	36600 / 27000	500	375	1100	375	180 / 7.000	13.56 / 10.00

*** 20337 Nm for 130mm and greater 15008 lb ft for 5.25 and 5.437 inch bores.**



Clutch sizes 750 to 1000 available with end face lubrication on request

IMPORTANT

The clutch must fit on a shaft with a recommended diameter tolerance of h6 for metric and inch shafts and to the USA shaft tolerance figures on page 50.

WARNING

The clutch must be mounted on a shaft with the inner race driven by a parallel key with top clearance. TAPER KEYS MUST NEVER BE USED.

SO/SX Series - Sprag Clutches - Sizes 750 to 1027

Sprag Clutch Reference	British Inch Sizes		Metric Sizes		USA Inch Sizes $	
	Bore H7 (in)	Keyway# W x D (in)	Bore H7 (mm)	Keyway# W x D (mm)	Bore (in)	Keyseat # W x D (in)
	2.500	0.625 x 0.313	60	18 x 5.5	2.4375	0.625 x 0.313
	2.750	0.625 x 0.313	65	18 x 5.5	2.500	0.625 x 0.313
	2.875	0.75 x 0.375	70	20 x 6.0	2.6875	0.625 x 0.313
750	3.000	0.75 x 0.375	75	20 x 6.0	2.750	0.625 x 0.313
	3.125	0.75 x 0.0250	80	22 x 7.0	2.9375	0.750 x 0.375
	3.250	0.75 x 0.0250	85	22 x 5.0	3.000	0.750 x 0.375
	3.375	0.75 x 0.189			3.250	0.750 x 0.250
	3.437	0.75 x 0.189			3.375	0.750 x 0.188
					3.4375	0.750 x 0.188
	3.000	0.750 x 0.375	70	20 x 6.0	3.000	0.750 x 0.375
	3.250	0.750 x 0.375	75	20 x 6.0	3.250	0.750 x 0.375
	3.437	0.875 x 0.438	80	22 x 7.0	3.4375	0.875 x 0.438
	3.500	0.875 x 0.438	85	22 x 7.0	3.500	0.875 x0.438
800	3.750	0.875 x 0.438	90	25 x 7.0	3.625	0.875 x 0.438
	4.000	1.000 x 0.500	95	25 x 7.0	3.750	0.875 x 0.438
	4.250	1.000 x 0.375	100	28 x 8.0	3.9375	1.000 x 0.500
	4.437	1.000 x 0.250	105	28 x 8.0	4.000	1.000 x 0.500
			110	28 x 8.0	4.250	1.000 x 0.375
					4.4375	1.000 x 0.250
	4.000	1.00 x 0.500	90	25 x 7.0	4.000	1.000 x 0.500
	4.250	1.00 x 0.500	100	28 x 8.0	4.250	1.000 x 0.500
	4.375	1.00 x 0.500	110	28 x 8.0	4.375	1.000 x 0.500
	4.437	1.00 x 0.500	120	32 x 9.0	4.4375	1.000 x 05.00
	4.500	1.00 x 0.500	125	32 x 9.0	4.500	1.000 x 0.500
900	4.750	1.00 x 0.500	130	32 x 9.0	4.750	1.000 x 0.500
	4.937	1.00 x 0.375			4.9375	1.000 x 0.375
	5.000	1.00 x 0.389			5.000	1.000 x 0.375
	5.250*	1.00 x 0.265			5.250*	1.000 x 0.250
	5.437*	1.00 x 0.268			5.4375*	1.000 x 0.250
	4.750	1.000 x 0.500	130	32 x 9.0	4.9375	1.250 x 0.625
	5.250	1.25 x 0.625	135	36 x 10.0	5.000	1.250 x 0.625
	5.437	1.25 x 0.625	140	36 x 10.0	5.250	1.250 x 0.625
1000	5.500	1.25 x 0.625	150	36 x 10.0	5.4375	1.250 x 0.625
&	5.750	1.25 x 0.625	160	40 x 11.0	5.500	1.250 x 0.625
1027	5.937	1.25 x 0.625			5.750	1.250 x 0.625
	6.000	1.25 x 0.625			5.9375	1.250 x 0.625
	6.250	1.50 x 0.50			6.000	1.250 x 0.625
	6.437	1.50 x 0.50			6.250	1.250 x 0.375
					6.4375	1.250 x 0.375
	6.500	1.50 x 0.50	170	40 x 11.0	6.500	1.500 x 0.500
1027	6.750	1.50 x 0.45	180	45 x 12.5	6.750	1.500 x 0.500
	6.937	1.50 x 0.45			6.875	1.500 x 0.500
	7.000	1.50 x 0.45			7.000	1.500 x 0.438

ORDERING INFORMATION

Clutch Reference	Part Numbers		
	Grease lubricated	Oil lubricated	Without seal
SO750	648 1751	648 1752	648 1753
SO800	648 1801	648 1802	648 1803
SO900	648 1901	648 1902	648 1903
SO1000	648 1001	648 1002	648 1003
SO1027	648 1271	648 1272	648 1273
SX750	648 2751	648 2752	648 2753
SX800	648 2801	648 2802	648 2803
SX900	648 2901	648 2902	648 2903
SX1000	648 2001	648 2002	648 2003
SX1027	648 2271	648 2272	648 2273

For British inch and metric sizes, recommend shaft tolerances are 'h6'.
$ For American Inch sizes, suffix bore 'A', see table on page 50 for bore and recommend shaft tolerances.
All keys must be parallel with top clearance - never use taper keys.
All keyway and keyseat depths are measured at side.
* see page 26.

When ordering please specify clutch reference/part number and bore size required.
eg. SX900/130mm or 6482902/130mm.

Sprag Clutch - Flanged Stub Shaft Adaptors

Stub shaft adaptors for use with SO and SX sprag clutches providing a mounting stub shaft for mechanical elements.

Features:

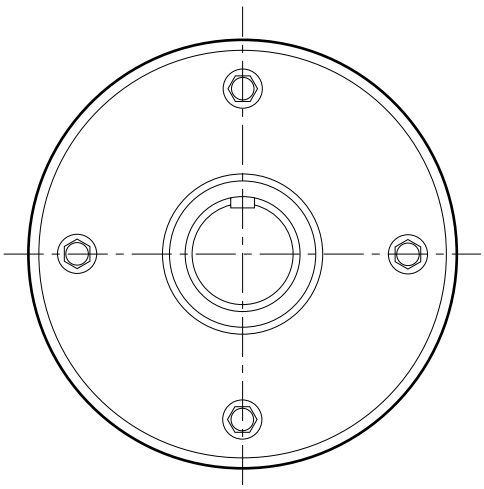
- Extended stub shaft used to fit couplings, chain pinions, gears, cams and index lever arms to standard sprag clutches giving extra design flexibility.
- Can reduce the overall dimensions of the combination drive package, thus allowing a more compact size.

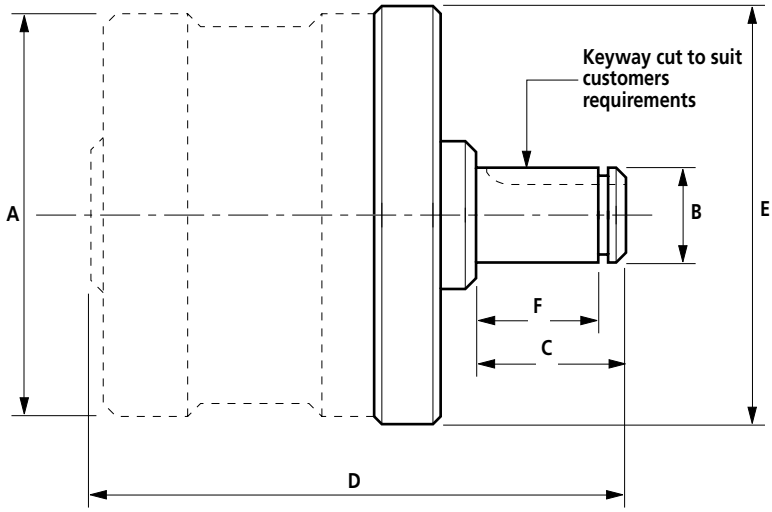
Applications:

- Fan drives
- Paper machinery
- Pump drives
- Textiles

Overrunning - Indexing - Backstopping

Sprag Clutch - Stub Shaft Adaptors





Sub-shaft adaptors can be used with SO and SX series Sprag Clutches to provide a mounting for mechanical elements such as chainwheels, couplings, gears, pulleys, cams, levers, etc., when the size or configuration of these parts does not allow bolting holes to be drilled to match the existing tapped holes in the clutch. Consult Renold for maximum overhung load capacity.

Standard adaptors are supplied to the dimensions shown below and the circlip groove is dimensioned to suit a Spirolox type RS circlip/snapring.

However, the sub-shaft portion may be reduced in diameter or shortened to suit customer's requirements and the circlip groove may be omitted or varied to suit other types of retaining ring.

When ordering, specify the Adaptor product number and keyway requirements; also please give details of any required variations as indicated in the preceding paragraph. If the adaptor is to be supplied assembled to a clutch the direction in which it is to drive the clutch inner race when viewed from the stub-shaft end should be stated.

Adaptor Part Number	Sprag Clutch Reference	A mm in	B (max) mm in	B (min) mm in	C mm in	D mm in	E mm in	F (min) mm in	Weight kg lb
645 500	SO / SX 400	88.90 3.500	19.08 0.751	19.05 0.750	38.1 1.50	129.4 5.09	98.4 3.88	33.12 1.304	0.73 1.6
645 501	SO / SX 500	107.95 4.250	31.78 1.251	31.75 1.250	44.5 1.75	157.2 6.19	117.5 4.63	38.71 1.524	1.45 3.2
645 502	SO / SX 600	136.52 5.375	44.48 1.751	44.45 1.750	50.8 2.00	171.5 6.75	146 5.75	44.96 1.77	2.63 5.8
645 503	SO / SX 700	180.97 7.125	69.9 2.752	69.85 2.750	63.5 2.50	214.3 8.44	194 7.63	56.44 2.22	5.72 12.6
645 504	SO / SX 750	222.25 8.750	82.6 3.252	82.55 3.250	76.2 3.00	266.7 10.5	241 9.5	68.35 2.691	10.79 23.8
645 505	SO / SX 800	254.00 10.000	108 4.252	107.95 4.250	95.3 3.75	282.57 11.125	273 10.75	87.27 3.436	18.37 40.5
645 506	SO/SX 900	304.80 12.000	133.4 5.252	133.35 5.250	114.3 4.50	311.15 12.25	324 12.75	105.84 4.167	28.49 62.8
645 507	SO/SX 1000	381.00 15.000	158.8 6.252	158.75 6.250	139.7 5.50	352.4 13.875	400 15.75	127.91 5.036	46.9 103.4
645 507	SO/SX 1027	381.00 15.000	158.8 6.252	158.75 6.250	139.7 5.50	344.42 13.56	400 15.75	127.91 5.036	46.9 103.4

RENOLD

Sprag Clutch - Flexible Coupling Combination

Pinflex Clutch

Gearflex Clutch

A medium to large power capacity sprag clutch and flexible coupling combination range.

Features:

- SO series clutch combined with Pinflex coupling allowing for angular, parallel and axial misalignment.
- Absorbs vibration and shock loads.
- SO series clutch with two flexible half Gearflex couplings forming a short cardan shaft accommodating parallel and angular misalignment.
- Flexible shaft connection for overrunning barring drive applications.
- Grease lubricated clutch used as standard for high overrunning speeds and infrequent maintenance.
- Allows larger shaft sizes to be used.

Construction:

- Pinflex clutch uses all steel coupling half bodies for compactness combined with strength
- Gearflex clutch uses all steel double engagement coupling for maximum flexibility

Applications:

- Barring drives
- Dual drive systems - overrunning
- Power generator sets
- Packaging machinery
- Textile industry
- Fan drives
- Steel works
- Mining industry
- General industrial applications

Overrunning - Barring Drives

SCPF and SCGF Series Sprag Clutch Couplings

Shafts should never be connected by a sprag clutch as shaft misalignment will create excessive loads on the clutch bearings and sprags and may result in failure.

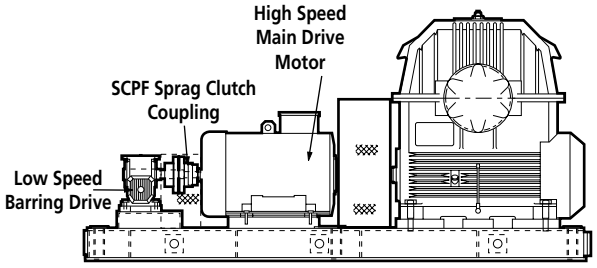
However by introducing a flexible coupling into the drive, the problem of shaft misalignment is reduced.

Renold have two types of sprag clutch coupling available, as standard, for other options consult Renold, details as follows:-

SCPF Series
SO Series sprag clutch fitted with a Pinflex coupling to allow for angular offset misalignment and to absorb vibration.

SCGF Series
SO Series sprag clutch fitted with two flexible half Gearflex couplings to form a short cardan or spacer shaft.
This design also allows for removal of the sprag clutch for replacement without the need to disturb the driving and driven elements.
The SCGF clutch coupling can accommodate a larger amount of parallel offset misalignment.

Sprag Clutch / Couplings can be used to connect barring drives or dual drives where there are two alternative motors driving a common gearbox input shaft, for example. The inner race should normally be mounted on the shaft which will be running for long periods at a relatively high speed, while the outer race is stationery. A Grease Lubricated clutch should be used when higher over running speeds are required and / or maintenance will be infrequent.



Selection
(1) All sprag clutch couplings should be selected on the driving torque:-

$$\text{Torque (Nm)} = \frac{\text{KW x 9550}}{\text{RPM}}$$

$$\text{Torque (lb.ft)} = \frac{\text{HP x 5250}}{\text{RPM}}$$

(2) Select the service factor from table 1.

(3) Selection torque = Actual Torque x Service Factor.

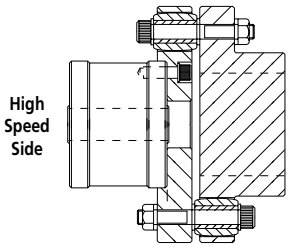
(4) Ensure that the selection will accept all shaft diameters.

PRIME MOVER	Driven Machine Classification		
	Steady	Medium	Heavy
AC Motor, Air Motor Steam Turbine	1.25	1.5	2.5
Multi Cylinder IC Engine	1.75	Consult Renold	Consult Renold
Single Cylinder IC Engine, Diesel Engine	Consult Renold	Consult Renold	Consult Renold

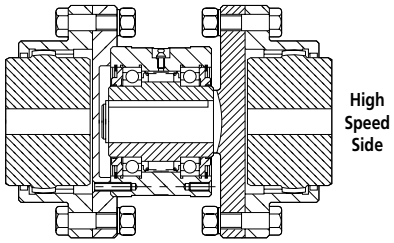
(5) It will be noted from page 32 and 33 that the inner race rotation speed capacity is higher than the outer race speed. The sprag clutch coupling should be designed into the drive system with the highest speed shaft rotation connected to the inner race of the sprag clutch.

(6) Direction of rotation should be stated when viewed from the high speed side.

Reference SCPF clutch coupling

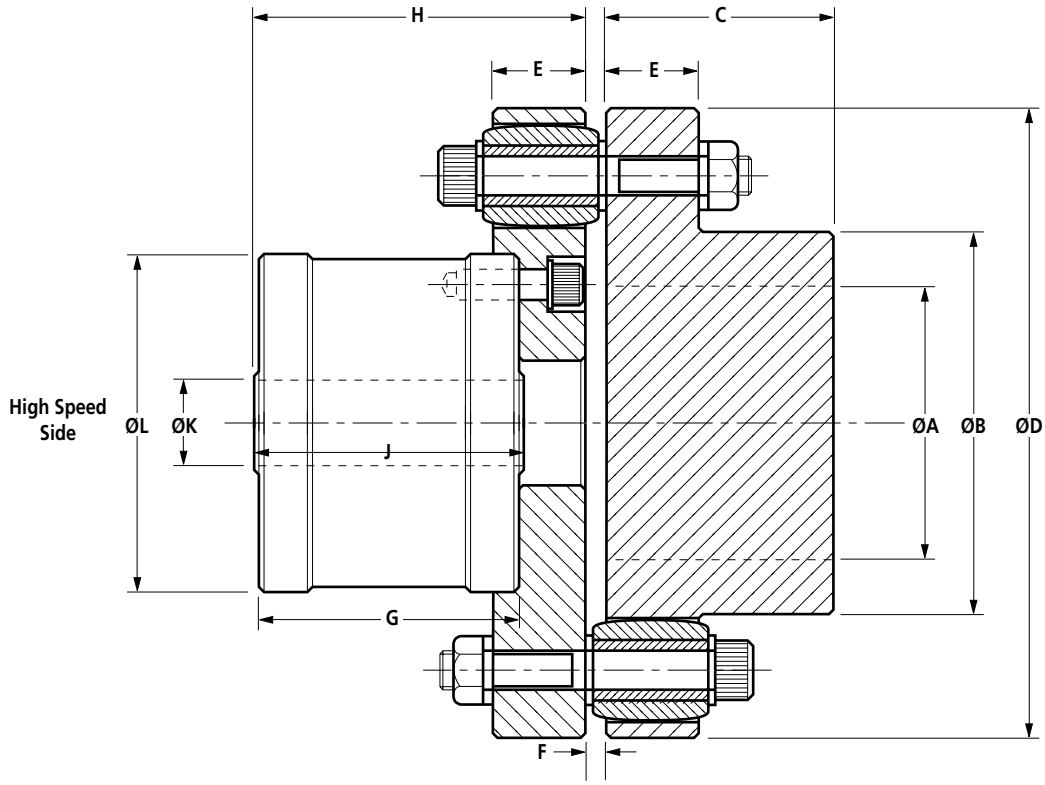


Reference SCGF clutch coupling



RENOLD

Pinflex - Sprag Clutch Coupling

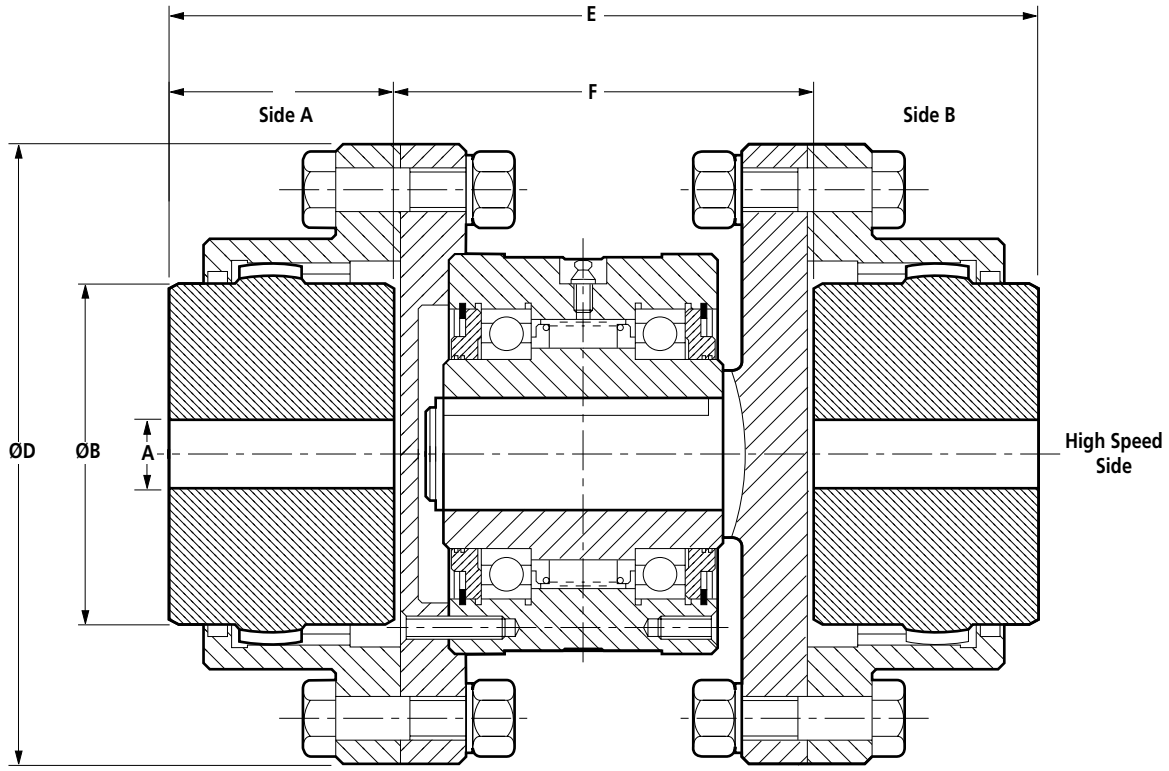


SCPF Clutch Coupling Reference	A (min) mm in	A (max) mm in	B mm in	C mm in	D mm in	E mm in	F mm in	G mm in	H mm in	J mm in	K (max) mm in	L mm in
SCPF400	-	72	110	60	165	25	5	68.26	87	70.1	22	88.90
	-	2.834	4.33	2.36	6.50	1.00	0.20	2.69	3.43	2.76	0.875	3.500
SCPF500	-	80	113	75	195	35	6	85.72	115	89.15	32	107.95
	-	3.149	4.45	2.98	7.68	1.38	0.24	3.37	4.53	3.51	1.312	4.250
SCPF600	-	110	150	89	235	35	6	92.08	122	95.5	50	136.53
	-	4.331	5.91	3.50	9.25	1.38	0.24	3.63	4.80	3.76	2.00	5.375
SCPF700	55	130	180	110	290	50	7	123.82	168	127.25	70	180.97
	2.17	5.118	7.09	4.33	11.42	1.97	0.28	4.87	6.61	5.00	2.9375	7.125
SCPF750	75	175	245	150	380	60	7	149.23	204	152.65	80	222.25
	2.95	6.890	9.65	5.91	14.96	2.36	0.28	5.88	8.03	6.00	3.25	8.750

SCPF Clutch Coupling Reference	Torque Capacity Nm lb ft	*Maximum Over Running Speed Inner Race rpm	Outer Race rpm	Maximum Drive Speed rpm	SO Sprag Clutch Reference	Pinflex Coupling Size	Coupling Max Bore mm in	Min Bore mm in
SCPF400	407	3600	850	5200	400	PF3	72	-
	300						2.875	
SCPF500	1585	3000	800	4400	500	PF4	80	-
	1168						3.125	-
SCPF600	3100	2400	750	3600	600	PF5	110	-
	2285						4.375	-
SCPF700	6900	2000	450	2900	700	PF6	130	55
	5086						5.125	2.165
SCPF750	9660	1800	650	2200	750	PF8	175	75
	7120						6.875	2.953

*Grease filled clutch only - for oil filled clutches contact Renold.

Gearflex - Sprag Clutch Coupling



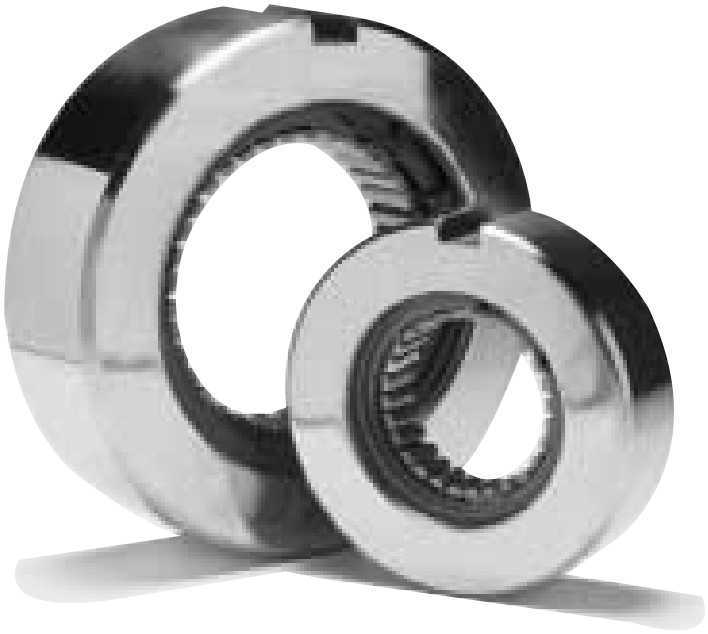
SCGF Clutch Coupling Reference	A (min) mm in	A (max) mm in	B mm in	C mm in	D mm in	E mm in	F mm in	L mm in
SCGF400	20 0.787	57 2.25	76 3	49 1.94	152 6	207 8.15	109 4.29	207 8.15
SCGF500	27 1.063	78 3.07	102 4	62 2.44	178 7	252 9.92	128 5.04	252 9.92
SCGF600	27 1.063	90 3.54	117 4.6	77 3.03	213 8.38	297 11.69	143 5.63	297 11.69
SCGF700	39 1.535	127 5	165 6.5	106 4.19	279 11	398 15.67	186 7.32	398 15.67
SCGF750	55 2.165	145 5.7	191 7.5	121 4.75	318 12.5	454 17.87	212 8.35	454 17.87

SCGF Clutch Coupling Reference	Torque Capacity Nm lb ft	*Maximum Over Running Speed Inner Race rpm	Outer Race rpm	Maximum Drive Speed rpm	SO Sprag Clutch Reference	Coupling Gearflex Coupling Size	Max Bore mm in	Min Bore mm in
SCGF400	407 300	3600	850	5400	400	GF15	57 2.25	20 0.787
SCGF500	1585 1168	3000	800	4800	500	GF20	78 3.07	27 1.063
SCGF600	3100 2285	2400	750	4250	600	GF25	90 3.54	27 1.063
SCGF700	6900 5086	2000	450	3600	700	GF35	127 5	39 1.535
SCGF750	9660 7120	1800	650	3290	750	GF40	145 5.7	55 2.165

*Grease filled clutch only - for oil filled clutches contact Renold.

RENOLD

DM Series - Sprag Clutches - Sizes 125 to 513



Direct mounting sprag clutch without bearings.

Features:

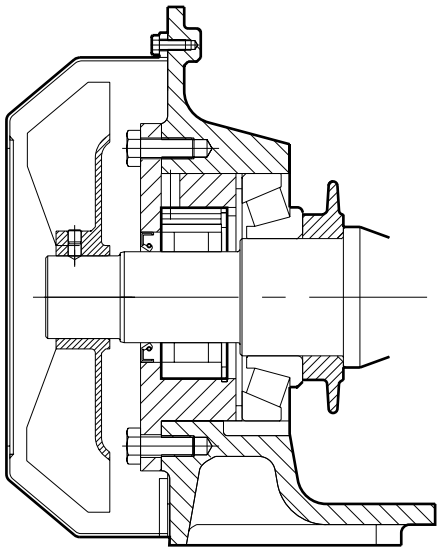
- High torque capacity yet compact direct mounting design.
- Suitable for backstopping applications.
- DM clutches drive directly onto the shaft, without an inner race, resulting in compact design.
- The clutch is suitable for use in gear units where the oil provides lubrication.

Applications:

- Conveyor Drives
- Foundry equipment drives
- Steel works
- Textile machinery
- Packaging machinery
- Water treatment

Overrunning - Indexing - Backstopping

DM Series - Sprag Clutches



DM series direct mounting sprag clutches are specifically designed for use as backstops in applications where compact dimensions are required. The clutch is designed to fit in a housing with the shaft as the inner race. This type is particularly suitable for use in gear units and similar equipment where good concentricity between shaft and housing is ensured. For all applications it is essential that shafts conform of the following specification.

Diameter:	Shaft diameter to tolerances shown in table for dimension 'B'
Carburised:	To an effective depth of 1.27 / 1.52mm (0.050" / 0.060") after grinding
Hardened:	Surface HV30 650 to 750. Core HV30 250 to 400
Ground:	Surface finish 13 to 20 micro-inches CLA Taper not to exceed 0.0003" per inch
Concentricity:	Shaft to be supported in bearings such that shaft and housing are concentric within 0.05mm (0.002") TIR Diametral clearance within housing to be 0.025 to 0.076mm (0.001" to 0.003")

SAFETY

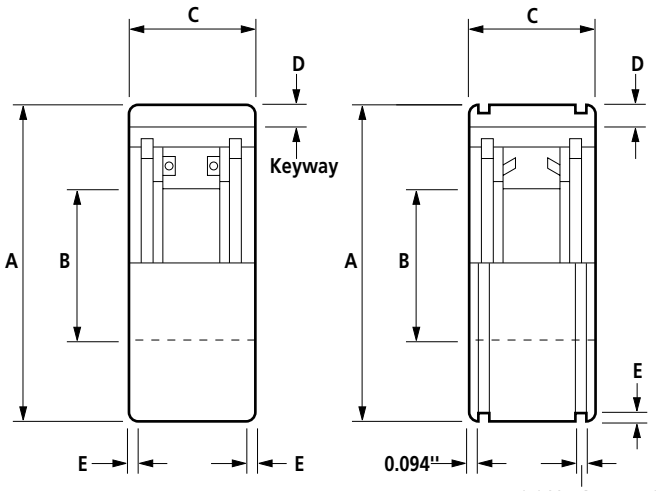
Sprag clutches used as hold back devices afford a reliable means of preventing run back provided our recommendations for routine lubrication by the user and periodic internal examination by Renold personnel are properly followed, but in the event of neglect or a serious overload it cannot be assumed that they will fail safe.

WARNING

Lubricant must not contain slippery additives or those containing extreme pressure characteristics.

RENOLD

DM Series - Sprag Clutches - Sizes 125 to 513



Clutch Sizes 25 to 400

Clutch Sizes 501 to 513

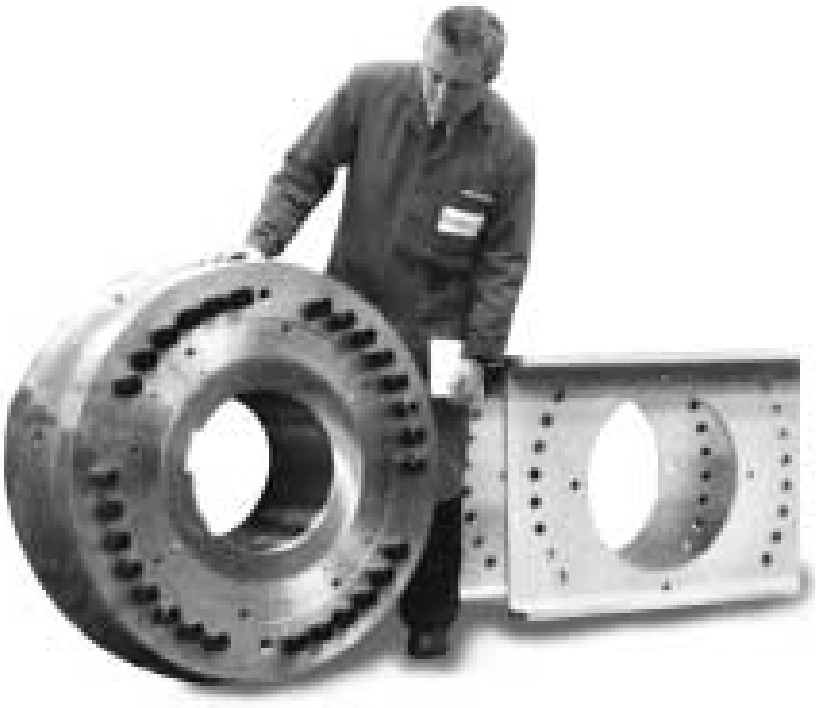
Part No.	DM Sprag Clutch Reference	Torque Capacity Nm / lb ft	Shaft O'running Speed rpm (max)	A (max) mm / in	A (min) mm / in	Shaft Diameter B (max) mm / in	Shaft Diameter B (min) mm / in	C (max) mm / in	C (min) mm / in	D mm / in	E mm / in	Weight Approx kg / lb
649033	125	143 105	1800	67.132 2.643	67.107 2.642	31.750 1.250	31.725 1.249	28.194 1.110	27.686 1.090	.250 x .125	.062 x 45	0.43 0.95
649034	150	314 232	1800	84.099 3.311	84.074 3.310	38.100 1.500	38.075 1.499	32.004 1.260	31.496 1.240	.375 x .187	.094 x 45	0.85 1.87
649035	175	427 315	1500	93.243 3.671	93.218 3.670	44.450 1.750	44.425 1.749	32.004 1.260	31.496 1.240	.375 x .187	.094 x 45	1.05 2.31
649056	200	601 443	1400	112.547 4.431	112.522 4.430	50.800 2.000	50.775 1.999	35.179 1.385	34.671 1.365	.500 x .250	.094 x 45	1.87 4.11
649057	225	739 545	1200	122.453 4.821	122.428 4.820	57.150 2.250	57.125 2.249	35.179 1.385	34.671 1.365	.500 x .250	.094 x 45	2.18 4.80
649036	250	832 614	1000	111.15 4.376	111.13 4.375	63.50 2.500	63.47 2.499	44.70 1.760	44.20 1.740	.500 x .250	.094 x 45	1.87 4.11
649039	275	966 712	1000	124.74 4.911	124.71 4.910	69.85 2.750	69.82 2.749	46.23 1.820	45.72 1.800	.500 x .250	.025 x 45	1.9 4.18
649040	300	1092 805	900	132.105 5.201	132.080 5.200	76.200 3.000	76.175 2.999	46.228 1.820	45.720 1.800	.500 x .250	.025 x 45	2.55 5.61
649037	325	1677 1237	850	146.710 5.776	146.685 5.775	82.550 3.250	82.525 3.249	51.054 2.010	50.546 1.990	.500 x .250	.025 x 45	3.8 8.4
649042	350	2262 1668	800	166.675 6.562	166.649 6.561	88.900 3.500	88.875 3.499	51.054 2.010	50.546 1.990	.625 x .312	.025 x 45	5.3 11.7
649203	375	3086 2276	750	172.237 6.781	172.212 6.780	95.250 3.750	95.225 3.749	60.579 2.385	60.071 2.365	.625 x .312	.025 x 45	6.52 14.3
649038	400	3417 2520	750	181.889 7.161	181.864 7.160	101.600 4.000	101.575 3.999	60.579 2.385	60.071 2.365	.625 x .312	.025 x 45	7.26 16.0
648250	501	51 38	2400	39.992 1.575	39.967 1.574	16.510 0.650	16.485 0.6495	25.654 1.010	25.146 0.990	.250 x .125	.03 x 45	0.18 0.40
648251	502	68 50	2400	46.965 1.849	46.939 1.848	18.753 0.7383	18.740 0.7378	22.479 0.885	21.971 0.865	.250 x .125	.03 x 45	0.23 0.51
648252	506	158 117	1800	61.963 2.4395	61.938 2.4385	28.791 1.1335	28.766 1.1325	25.654 1.010	25.146 0.990	.250 x .125	.03 x 45	0.37 0.81
648253	507	203 150	1800	61.963 2.4395	61.938 2.4385	24.653 0.9706	24.628 0.9696	28.829 1.135	28.321 1.115	.250 x .125	.03 x 45	0.48 1.06
648254	509	339 250	1800	71.963 2.8332	71.938 2.8322	28.791 1.1335	28.766 1.1325	32.004 1.260	31.496 1.240	.250 x .125	.03 x 45	0.73 1.61
648255	510	452 333	1800	79.972 3.1485	79.934 3.147	32.931 1.2965	32.906 1.2955	35.179 1.385	34.671 1.365	.375 x .187	.03 x 45	0.92 2.02
648256	511	678 500	1800	79.985 3.149	79.959 3.148	35.001 1.378	34.976 1.377	41.529 1.635	41.021 1.615	.375 x .187	.03 x 45	1.18 2.60
648257	512	904 667	1800	89.967 3.542	89.941 3.541	39.141 1.541	39.116 1.540	41.529 1.635	41.021 1.615	.375 x .187	.03 x 45	1.37 3.01
648258	513	1582 1167	1200	120.650 4.750	120.625 4.749	51.961 2.0457	51.935 2.0447	44.70 1.760	44.20 1.740	.500 x .250	.03 x 45	2.81 6.18

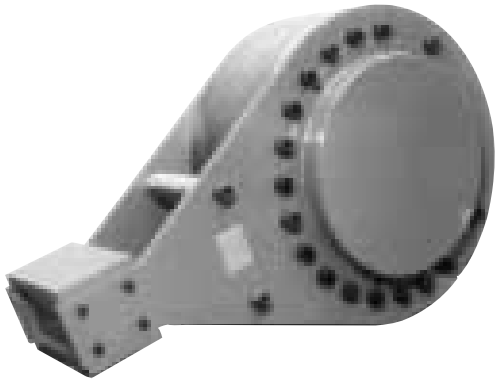
When ordering please specify: clutch reference and part number.

Sprag Clutch Holdbacks - Backstops

- Heavy duty sprag clutches eliminate reverse rotation when used on non-backdriving applications.
- Precision sprags create instantaneous action with no backlash.
- High Torque capacity yet compact design.
- Enhanced sealing available on large clutch sizes for use in hostile environment.

- All clutches are fitted with high precision heavy duty bearings for arduous duty applications.
- Grease lubrication available where maintenance is difficult or where high inner race overrunning speeds are required.
- SO series clutches, grease lubricated for use on general purpose backstopping applications.





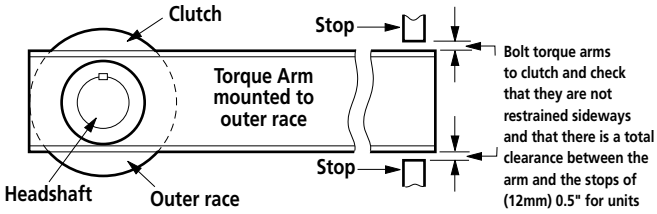
Applications

- Conveyor drives
- Elevators
- Fan drives
- Feeders
- Pumps
- General industrial applications

Sprag Clutch Holdbacks - Selections

Renold Sprag Clutch Holdbacks are devices that can eliminate reverse rotation if fitted to the headshaft of an inclined conveyor, bucket elevator or pump drive, fan drives etc.

The Sprag Clutch can be restrained with a number of variations of torque arm designs as can be seen on pages 37 to 49 in this catalogue. When the clutch is directly mounted to the machine headshaft, the torque arm should be restrained by stops built into the machine framework to prevent reverse rotation and yet allow a small amount of float for inaccuracies in the headshaft bearings and fabrication.



Holdback Selection Procedure

The backstopping torque for an inclined conveyor or bucket elevator can be calculated in several different ways, the basic methods are shown here. Renold recommends considering all aspects of the equipment design and using whichever value is greater for the selection of the backstop.

1. Runback Torque

The first method is based on CEMA (Conveyor Equipment Manufacturing Association) recommendations, this allows friction to be considered as a partial aid to resisting runback of an inclined conveyor but a service factor must be used depending on the duty of the equipment.

Selection Service Factor F_1

For backstopping up to 3 times per day Service Factor = 1.0
For backstopping up to 10 times per day Service Factor = 1.5
For backstopping over 10 times per day Service Factor = 2.0

Conveyors

$$\text{Torque (Nm)} = \frac{(F_1) \times (\text{kW to lift load} - 1/2\ \text{kW to overcome friction}) \times 9550}{\text{Backstop shaft RPM}}$$

$$\text{Torque (lb.ft)} = \frac{(F_1) \times (\text{Hp to lift load} - 1/2\ \text{Hp to overcome friction}) \times 5250}{\text{Backstop shaft RPM}}$$

Bucket Elevators

For bucket elevators it is not usual to consider friction as an aid to holdback because the value is so small relative to the capacity of the elevator but a service factor must be used as above.

$$\text{Torque (Nm)} = \frac{(F_1) \times (\text{kW to lift load}) \times 9550}{\text{Backstop shaft RPM}}$$

$$\text{Torque (lb.ft)} = \frac{(F_1) \times (\text{Hp to lift load}) \times 5250}{\text{Backstop shaft RPM}}$$

2. Motor Breakdown or Stall Torque

An alternative methods is to consider the maximum Motor Breakdown or Stall Torque. Depending on the motor size and design, this could be as much as 300% or more of the Motor Nameplate Torque, the actual value can be found by reference to the manufacturer of the motor. The Breakdown (or Stall or Pull Out) torque, when applied to the conveyor, will allow overloading, before stalling, resulting in higher load to be held by the backstop. A service factor must be used depending on the Breakdown Torque % over Nameplate Torque.

Selection Service Factor F_2

Breakdown Torque up to and including 175% Service Factor = 1.0
Breakdown Torque over 175% and up to 250% Service Factor = 1.2
Breakdown Torque over 250% and up to 400% Service Factor = 1.5

$$\text{Torque (Nm)} = \frac{(F_2) \times (\text{Motor Nameplate kW}) \times 9550}{\text{Backstop shaft RPM}}$$

$$\text{Torque (lb.ft)} = \frac{(F_2) \times (\text{Motor Nameplate Hp}) \times 5250}{\text{Backstop shaft RPM}}$$

3. Torque Limiting

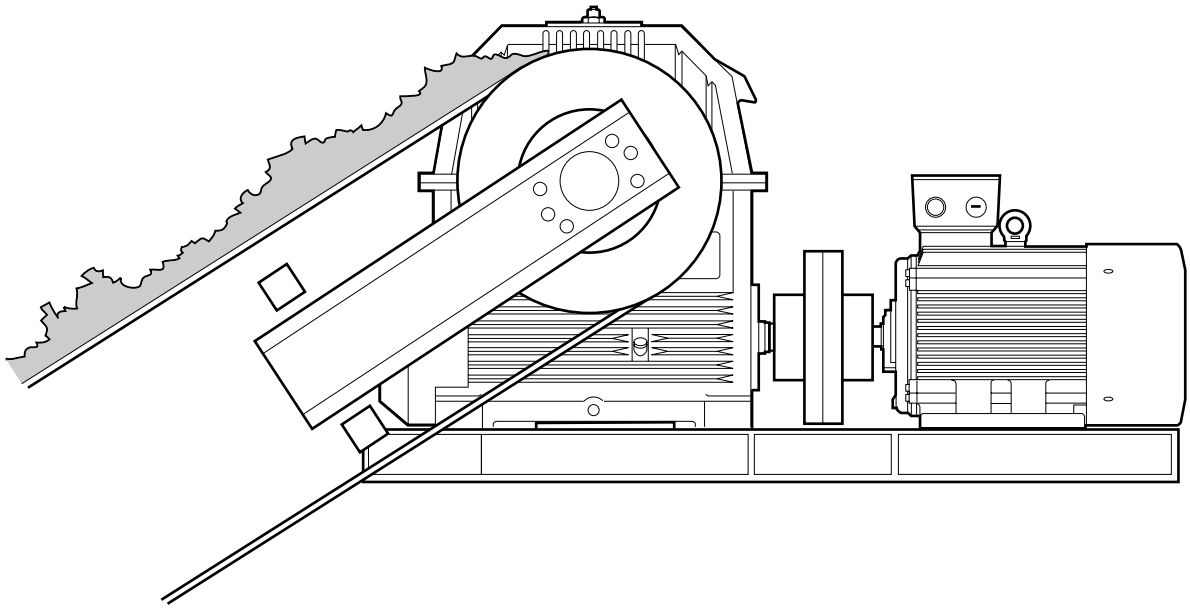
Where a torque limiting device is used, it is possible to select a backstop based on motor nameplate torque, but with the torque limiter set at 175% of above. See page 49.

4. Multi Point Drives

Sprag Clutch Holdbacks can be used in multi point drive systems. For selection advice, please consult Renold.

If a torque limiting device is incorporated with the holdback and set at up to 175% of Motor Nameplate torque, then the holdback should be selected by the CEMA formula with a minimum Service Factor of 1.5.

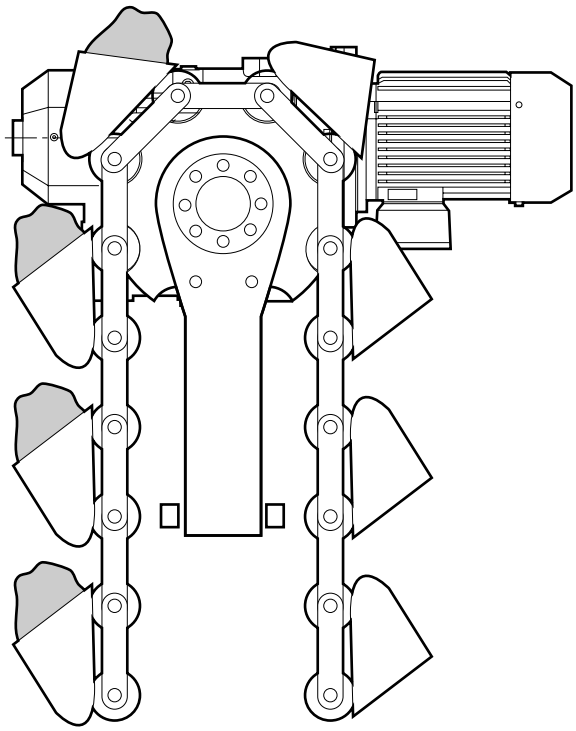
Sprag Clutch Holdbacks - Applications



The applications shown are an inclined belt conveyor and a vertical bucket elevator using conveyor chain. Both applications require the use of a sprag clutch backstop or holdback.

If reverse rotation occurred serious safety problems would be created and possible machinery failure.

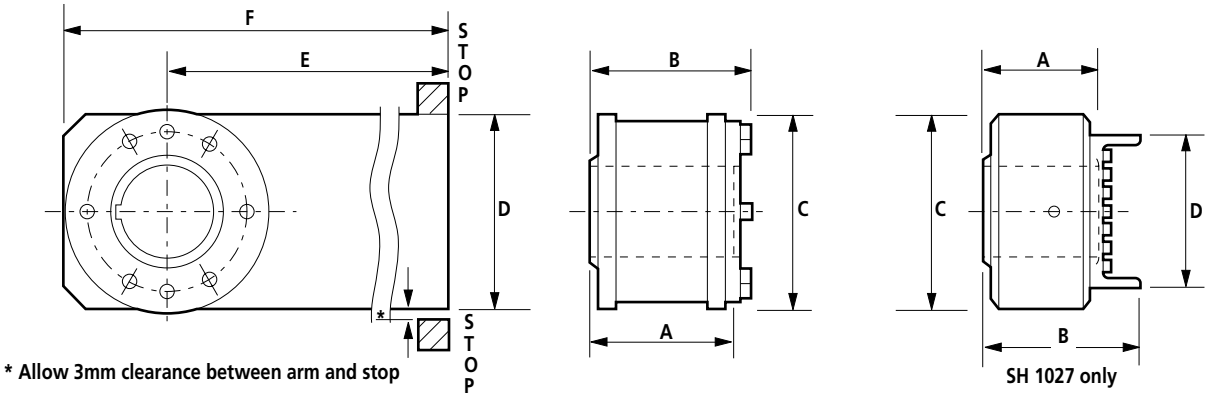
To overcome the problem of drive reversal a Renold sprag clutch backstop clutch is fitted to the conveyor headshaft and held with a torque arm against stops fitted to the framework of the conveyor.



RENOLD

SH Series Sprag Clutches Holdback Sizes 700 to 1027

Longlife Holdback Clutches



* Allow 3mm clearance between arm and stop

SH 1027 only

Standard SH Series clutches are self-contained sprag clutches supplied complete with torque arm and ready for mounting on the headshafts, or other suitable driving shafts, of inclined conveyors or elevators so as to prevent runback.

#Bore sizes see Page 44

Sprag Clutch Size Ref.	Torque Capacity Nm / lb ft	Maximum O'running Speed rpm	Resistance After Run-in Nm / lb ft	Bore Range# Min mm / in	Bore Range# Max mm / in	Dimensions A mm / in	B mm / in	C mm / in	D mm / in	E mm / in	F mm / in	Weight Approx. kg / lb
SH700	5420 4000	400	5.08 3.75	50 1.875	70 2.9375	127.25 5.00	155 6.10	181 7.13	180 7.09	762 30.00	854 33.62	43.5 95.7
SH750	9220 6800	380	7.12 5.25	60 2.500	85 3.437	152.65 6.00	181 7.13	222 8.74	220 8.66	813 32.00	924 36.38	67.0 147
SH800	15600 11513	300	8.47 6.25	70 3.000	110 4.437	152.65 6.00	186 7.32	254 10.0	250 9.84	813 32.00	940 37.00	88.5 195
SH900	24400** 18000**	250	13.56 10.00	90 4.000	130 5.437	162.18 6.39	204 8.03	305 12.0	300 11.81	1118 44.00	1270 50.00	153 337
SH1027	36600 27000	200	13.56 10.00	130 5.000	180 7.000	168.6 6.64	256 10.1	381 15.0	305 12.00	1553 61.10	1743 68.62	200 440

** 20337 Nm for 130mm and greater
15008 lb ft for 5.25 and 5.437 ins bores.

IMPORTANT

The clutch must fit on a shaft with a recommended diameter tolerance of g7 for metric and inch shafts or to the USA shaft tolerance figures on page 44 and 45.

WARNING

The clutch must be mounted on a shaft with the inner race driven by a parallel key with top clearance.
TAPER KEYS MUST NEVER BE USED.

ORDERING INFORMATION

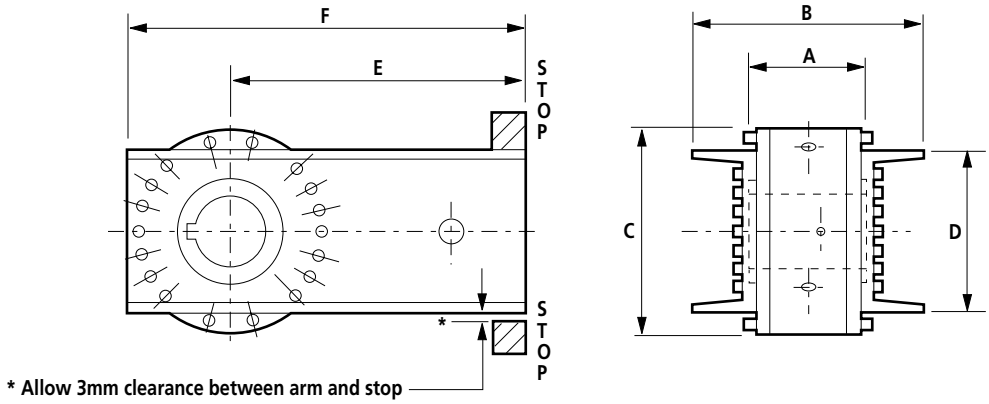
Sprag Clutch Size Ref.	Part Number
SH700	648390
SH750	648392
SH800	648394
SH900	648396
SH1027	648398

When ordering please specify: clutch reference part, number and bore size.

eg. SH700/60mm or 648390/60mm.

SH Series Sprag Clutches Holdback Sizes 1051 to 5000

Longlife Holdback Clutches



* Allow 3mm clearance between arm and stop

#Bore sizes see Page 45

SH Sprag Clutch Ref.	Torque Capacity Nm / lb ft	Maximum O'running Speed rpm	Resistance After Run-in Nm / lb ft	Bore Range# Min mm / in	Bore Range# Max mm / in	Dimensions A mm / in	B mm / in	C mm / in	D mm / in	E mm / in	F mm / in	Weight Approx. kg / lb
SH1051	61000 / 45000	200	16 / 11.8	130 / 5	180 / 7	229 / 9	400 / 15.75	381 / 15	305 / 12	1550 / 61	1740 / 68.5	306 / 673
SH1250	88100 / 65000	170	30 / 22.1	190 / 7.5	230 / 9	254 / 10	428 / 16.9	480 / 18.9	381 / 15	1670 / 65.75	1920 / 75.6	447 / 983
SH1300	122000 / 90000	140	34 / 25.1	200 / 8	250 / 10	260 / 10.25	432 / 17	546 / 21.54	432 / 17	1700 / 67	1980 / 77.95	600 / 1320
SH1375	183000 / 135000	130	47 / 34.6	240 / 9	280 / 11	270 / 10.625	399 / 15.7	616 / 24.25	465 / 18.25	1780 / 70	2090 / 82.28	772 / 1698
SH2000	271200 / 200000	100	75 / 55.4	280 / 11	335 / 13.25	270 / 10.625	483 / 19	737 / 29	610 / 24	2080 / 81.9	2450 / 96.5	1140 / 2508
SH2400	359300 / 265000	85	105 / 77.5	340 / 13	400 / 15.5	277 / 10.9	514 / 20.25	864 / 34	686 / 27	2100 / 82.7	2530 / 99.6	1456 / 3203
SH3500	508400 / 375000	80	142 / 105	360 / 13.5	500 / 20	318 / 12.5	551 / 21.7	965 / 38	770 / 30.3	2100 / 82.7	2580 / 101.6	2250 / 4950
SH5000	759300 / 560000	75	169 / 124	350 / 13.5	500 / 20	445 / 17.5	704 / 27.75	965 / 38	851 / 33.5	2100 / 82.7	2580 / 101.6	2994 / 6587

IMPORTANT

The clutch must run fit a shaft with a recommended diameter tolerance of g7 for metric and inch shafts or to the USA shaft tolerance figures on page 44 and 45.

WARNING

The clutch must be mounted on a shaft with the inner race driven by a parallel key with top clearance.

TAPER KEYS MUST NEVER BE USED.

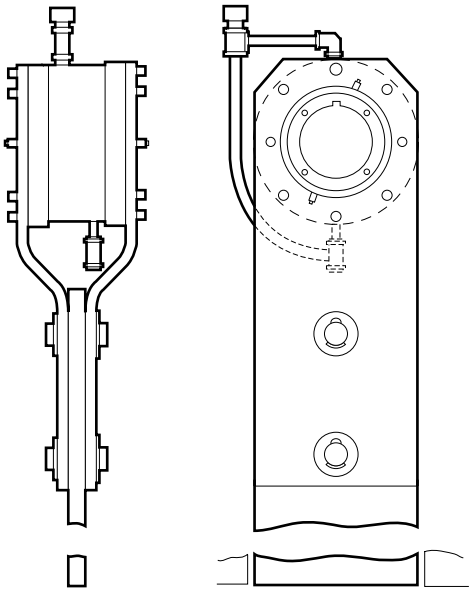
ORDERING INFORMATION

Sprag Clutch Size Ref.	Part Number
SH1051	648400
SH1250	648402
SH1300	648404
SH1375	648406
SH2000	648408
SH2400	648410
SH3500	648412
SH5000	648414

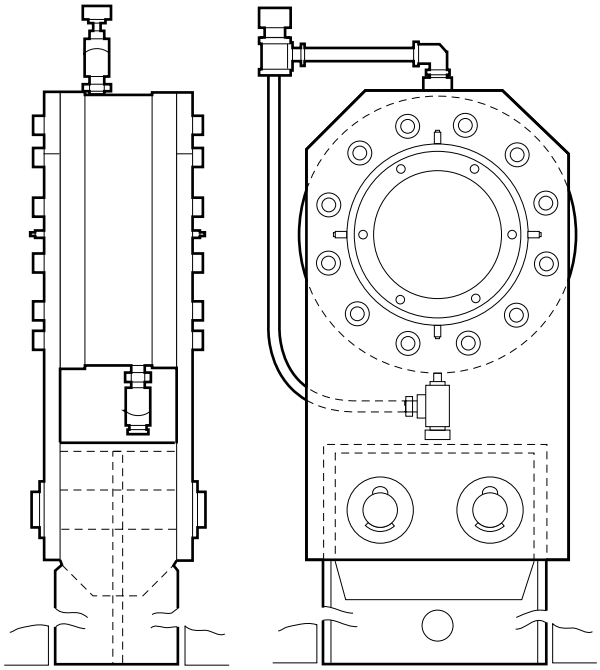
When ordering please specify: clutch reference, part number and bore size.

eg. SH1375/9.00" or 648406/9.00" suffix 'A' for American bore.

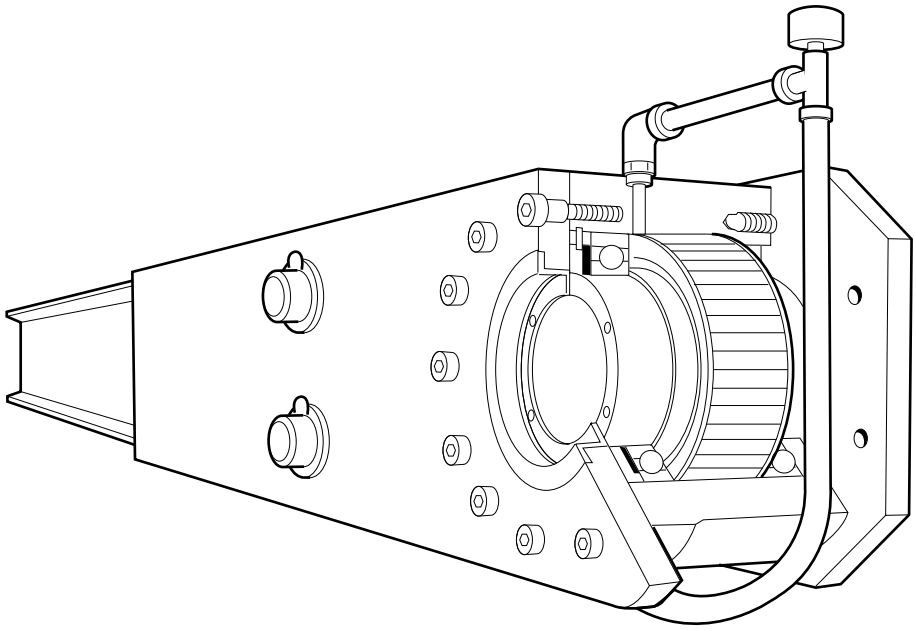
SLH Series Sprag Clutch Holdback Sizes 700 to 1027



Sprag clutch sizes 700 to 900
Alternative Design

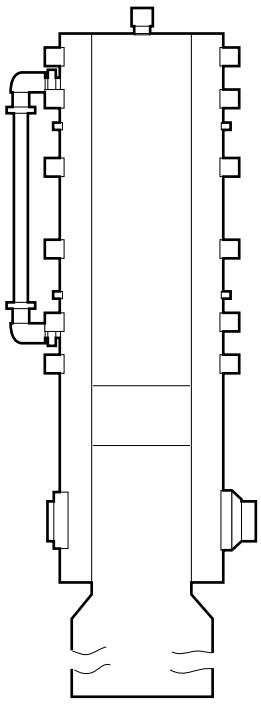


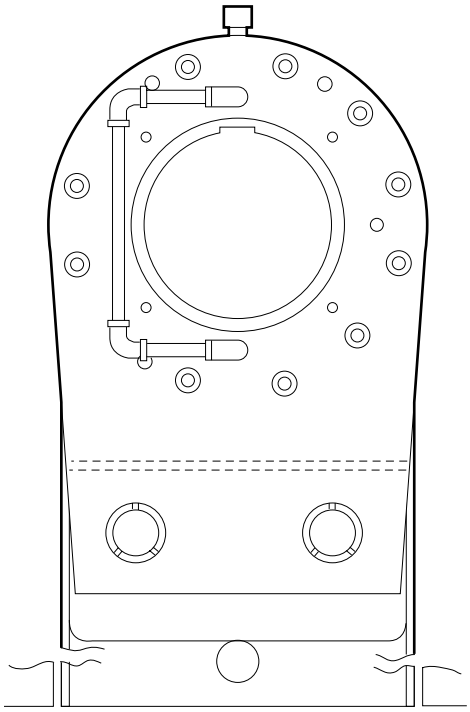
Sprag clutch size 1027 only
Alternative Design

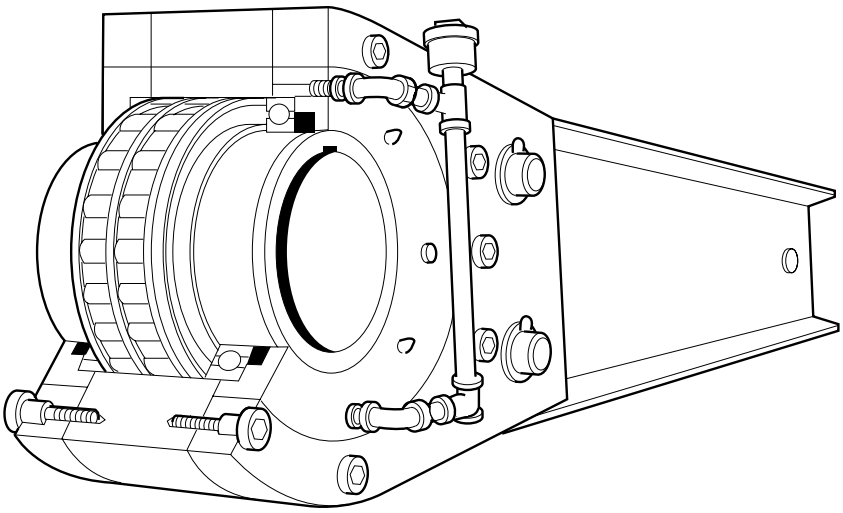


Various sprag clutch holdback torque arm and sideplate design arrangements are obtainable from Renold clutches and couplings. A number of alternative options are shown on pages 42 and 43.

SLH Series Sprag Clutch Holdback Sizes 1051 to 5000







Various sprag clutch holdback torque arm and sideplate design arrangements are obtainable from Renold clutches and couplings. A number of alternative options are shown on pages 42 and 43.

RENOLD

SH and SLH Series Sprag Clutch Holdback Bore Sizes

Sprag Clutch Size	British Inch Sizes		Metric Sizes		USA Inch Sizes $	
	Bore H7 (in)	Keyway # W X D (in)	Bore H7 (mm)	Keyway # W X D (mm)	Bore (in)	Keyseat # WxD (in)
700	2.000	0.500 X 0.250	50	14 X 4.3	1.875	0.375 x 0.188
	2.250	0.500 X 0.250	55	16 X 4.3	1.9375	0.500 x 0.250
	2.375	0.625 X 0.313	60	18 X 4.6	2.000	0.500 x 0.250
	2.500	0.625 X 0.313	65	18 X 5.4	2.125	0.500 x 0.250
	2.750	0.625 X 0.219	70	20 X 4.8	2.250	0.500 x 0.250
	2.9375	0.625 X 0.172			2.375	0.625 x 0.313
					2.4375	0.625 x 0.313
					2.500	0.625 x 0.313
					2.625	0.625 x 0.250
					2.750	0.625 x 0.219
					2.9375	0.625 x 0.125
750	2.500	0.625 X 0.313	60	18 X 5.5	2.4375	0.625 x 0.313
	2.750	0.625 X 0.313	65	18 X 5.5	2.500	0.625 x 0.313
	2.875	0.75 X 0.375	70	20 X 6.0	2.6875	0.625 x 0.313
	3.000	0.75 X 0.375	75	20 X 6.0	2.750	0.625 x 0.313
	3.125	0.75 X 0.250	80	22 X 7.0	2.9375	0.750 x 0.375
	3.250	0.75 X 0.250	85	22 X 5.0	3.000	0.750 x 0.375
	3.375	0.75 X 0.189			3.250	0.750 x 0.250
	3.437	0.75 X 0.189			3.375	0.750 x 0.188
					3.4375	0.750 x 0.188
800	3.000	0.750 X 0.375	70	20 X 6.0	3.000	0.750 x 0.375
	3.250	0.750 X 0.375	75	20 X 6.0	3.250	0.750 x 0.375
	3.437	0.875 X 0.438	80	22 X 7.0	3.4375	0.875 x 0.438
	3.500	0.875 X 0.438	85	22 X 7.0	3.500	0.875 x 0.438
	3.750	0.875 X 0.438	90	25 X 7.0	3.625	0.875 x 0.438
	4.000	1.000 X 0.500	95	25 X 7.0	3.750	0.875 x 0.438
	4.250	1.000 X 0.375	100	28 X 8.0	3.9375	1.000 x 0.500
	4.437	1.000 X 0.250	105	28 X 8.0	4.000	1.000 x 0.500
			110	28 X 8.0	4.250	1.000 x 0.375
					4.4375	1.000 x 0.250
900	4.000	1.00 X 0.500	90	25 X 7.0	4.000	1.000 x 0.500
	4.250	1.00 X 0.500	100	28 X 8.0	4.250	1.000 x 0.500
	4.375	1.00 X 0.500	110	28 X 8.0	4.375	1.000 x 0.500
	4.437	1.00 X 0.500	120	32 X 9.0	4.4375	1.000 x 0.500
	4.500	1.00 X 0.500	125	32 X 9.0	4.500	1.000 x 0.500
	4.750	1.00 X 0.500	130	32 X 9.0	4.750	1.000 x 0.500
	4.937	1.00 X 0.375			4.9375	1.000 x 0.375
	5.000	1.00 X 0.389			5.000	1.000 x 0.375
	5.250	1.00 X 0.265			5.250	1.000 x 0.250
	5.437	1.00 X 0.268			5.4375	1.000 x 0.250
1027	5.000	1.25 X 0.625	130	32 X 9.0	4.9375	1.250 x 0.625
	5.250	1.25 x 0.625	135	36 X 10.0	5.000	1.250 x 0.625
	5.437	1.25 X 0.625	140	36 X 10.0	5.250	1.250 x 0.625
	5.500	1.25 X 0.625	150	36 X 10.0	5.4375	1.250 x 0.625
	5.750	1.25 X 0.625	160	40 X 11.0	5.500	1.250 x 0.625
	5.937	1.25 X 0.625	170	40 X 11.0	5.750	1.250 x 0.625
	6.000	1.25 X 0.625	180	45 X 12.5	5.9375	1.250 x 0.625
	6.250	1.50 X 0.500			6.000	1.250 x 0.625
	6.437	1.50 X 0.500			6.250	1.250 x 0.375
	6.500	1.50 X 0.500			6.4375	1.250 x 0.375
	6.750	1.50 X 0.450			6.500	1.500 x 0.500
	6.937	1.50 X 0.450			6.750	1.500 x 0.500
	7.000	1.50 X 0.450			6.875	1.500 x 0.500
					7.000	1.500 x 0.438

For British Inch and Metric Sizes, recommended shaft tolerances are 'g7'.

$ For American Inch Sizes, suffix bore 'A', see table on page 50 for bore and recommended shaft tolerances.

All Keys must be parallel with top clearance - never use taper keys.

All keyway and keyseat depths are measured at side.

SLH Series Sprag Clutch Holdback Bore Sizes

Sprag Clutch Size	British Inch Sizes		Metric Sizes		USA Inch Sizes $	
	Bore H7 (in)	Keyway # W X D (in)	Bore H7 (mm)	Keyway # W X D (mm)	Bore (in)	Keyseat# W x D (in)
1051	5.00	1.250 x 0.625	130	32 X 7.4	5.00	1.000 x 0.375
	5.25	1.250 x 0.625	140	36 X 8.4	5.25	1.000 x 0.250
	5.50	1.250 x 0.625	150	36 X 8.4	5.50	1.250 x 0.625
	5.75	1.250 x 0.625	160	40 X 9.4	5.75	1.250 x 0.625
	6.00	1.250 x 0.625	170	40 X 9.4	6.00	1.500 x 0.625
	6.25	1.500 x 0.625	180	45 X 10.4	6.25	1.500 x 0.500
	6.50	1.500 x 0.625			6.50	1.500 x 0.500
	6.75	1.500 x 0.500			6.75	1.500 x 0.500
	7.00	1.500 x 0.438			7.00	1.500 x 0.500
1250	7.50	1.750 x 0.875	190	45 X 10.4	7.50	1.750 x 0.875
	7.75	1.750 x 0.875	200	45 X 10.4	7.75	1.750 x 0.875
	8.00	1.750 x 0.625	220	50 X 11.4	8.00	1.750 x 0.625
	8.25	1.750 x 0.625	230		8.25	1.750 x 0.625
	8.50	1.500 x 0.500			8.50	1.500 x 0.500
	8.75	1.500 x 0.500			8.75	1.500 x 0.500
	9.00	1.500 x 0.500			9.00	1.500 x 0.500
1300	8.00	1.750 x 0.875	200	45 X 10.4	8.00	1.750 x 0.875
	8.25	1.750 x 0.875	220	50 X 11.4	8.25	1.750 x 0.875
	8.50	1.750 x 0.875	240	50 X 11.4	8.50	1.750 x 0.875
	8.75	1.750 x 0.875	250		8.75	1.750 x 0.875
	9.00	1.750 x 0.875			9.00	1.500 x 0.500
	9.25	1.750 x 0.875			9.25	1.500 x 0.500
	9.50	1.500 x 0.500			9.50	1.500 x 0.500
	9.75	1.500 x 0.500			9.75	1.500 x 0.500
	10.00	1.500 x 0.500			10.00	1.500 x 0.500
1375	9.00	1.750 x 0.875	240	56 X 12.4	9.00	1.750 x 0.875
	9.25	1.750 x 0.875	260	56 X 12.4	9.25	1.750 x 0.875
	9.50	1.750 x 0.875	280	63 X 12.4	9.50	1.750 x 0.875
	9.75	1.750 x 0.875			9.75	1.750 x 0.875
	10.00	1.750 x 0.875			10.00	1.750 x 0.875
	10.25	1.750 x 0.875			10.25	2.000 x 0.750
	10.50	2.000 x 0.750			10.50	2.000 x 0.750
	10.75	2.000 x 0.750			10.75	2.000 x 0.750
	11.00	2.000 x 0.750			11.00	2.000 x 0.750
2000	11.00	2.500 x 1.250	280	63 X 12.4	11.00	2.500 x 1.250
	11.50	2.500 x 1.250	300	70 X 14.4	11.50	2.500 x 1.250
	12.00	2.500 x 1.250	320	70 X 14.4	12.00	2.500 x 1.250
	12.50	2.500 x 1.000	340	80 X 15.4	12.50	2.500 x 1.000
	13.00	2.500 x 1.000			13.00	2.500 x 1.000
	13.25	2.500 x 1.000			13.25	2.500 x 1.000
2400	13.00	2.500 x 1.250	340	80 X 15.4	13.00	2.500 x 1.250
	13.50	2.500 x 1.250	350	80 X 15.4	13.50	2.500 x 1.250
	14.00	2.500 x 1.250	360	80 X 15.4	14.00	2.500 x 1.250
	14.50	2.500 x 1.250	380	80 X 15.4	14.50	2.500 x 1.250
	15.00	2.500 x 1.250	400	90 X 17.4	15.00	2.500 x 1.250
	15.50	2.500 x 1.000			15.50	2.500 x 1.000
3500	13.50	2.500 x 1.250	360	80 X 15.4	13.50	2.500 x 1.250
	14.00	2.500 x 1.250	380	80 X 15.4	14.00	3.000 x 1.500
	14.50	3.000 x 1.500	400	90 X 17.4	14.50	3.000 x 1.500
	15.00	3.000 x 1.500	420	90 X 17.4	15.00	3.000 x 1.500
	16.00	3.000 x 1.500	450	100 X 19.5	16.00	3.000 x 1.500
	17.00	3.000 x 1.500	500	100 X 19.5	17.00	3.000 x 1.500
	18.00	3.000 x 1.500			18.00	3.000 x 1.500
	20.00	3.000 x 1.250			20.00	3.000 x 1.250
5000	13.50	2.500 x 1.250	360	80 X 15.4	13.50	2.500 x 1.250
	14.00	3.000 x 1.500	380	80 X 15.4	14.00	3.000 x 1.500
	14.50	3.000 x 1.500	400	90 X 17.4	14.50	3.000 x 1.500
	15.00	3.000 x 1.500	420	90 X 17.4	15.00	3.000 x 1.500
	16.00	3.000 x 1.500	450	100 X 19.5	16.00	3.000 x 1.500
	17.00	3.000 x 1.500	500	100 X 19.5	17.00	3.000 x 1.500
	18.00	3.000 x 1.500			18.00	3.000 x 1.500
	20.00	3.000 x 1.250			20.00	3.000 x 1.250

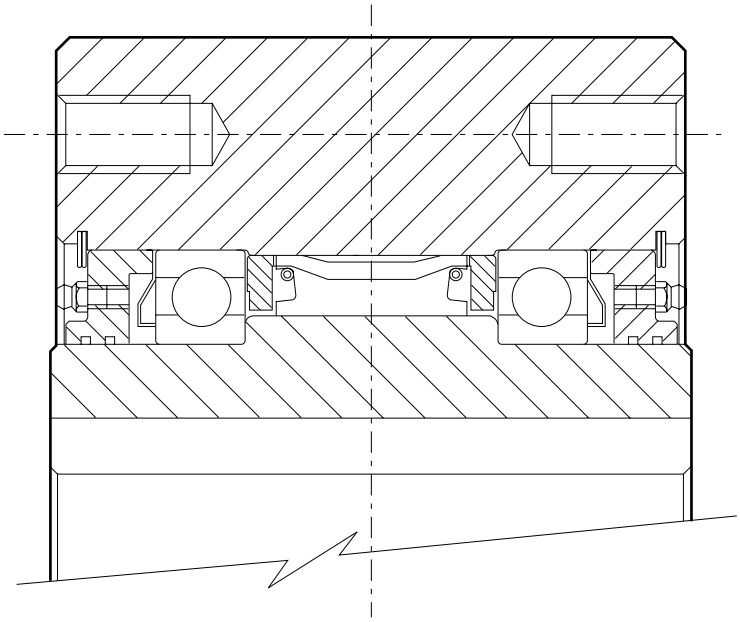
For British Inch and Metric Sizes, recommended shaft tolerances are 'g7'.

$ For American Inch Sizes, suffix bore 'A', see table on page 50 for bore and recommended shaft tolerances.

All Keys must be parallel with top clearance - never use taper keys.

All keyway and keyseat depths are measured at side.

Enhanced Seal Holdback Sprag Clutches



The Renold enhanced seal sprag clutch range of products are based on the standard size range of 1027 to 3500. The design of the clutch includes a Labyrinth seal, preventing the ingress of abrasive dust, grit and moisture making it suitable for use in most hostile environments. Each clutch is factory filled with long life grease which reduces working temperature allowing the backstops to operate more efficiently at higher ambient temperatures.

- Long life lubrication reduces maintenance costs.
- Larger heavy duty bearings increasing the running life.
- Labyrinth seal to prevent ingress of dust and moisture making it suitable for use in hostile environments.
- Detachable side plates allowing interchangeability with other manufacturers backstops.

Enhanced Seal Holdback Sprag Clutches

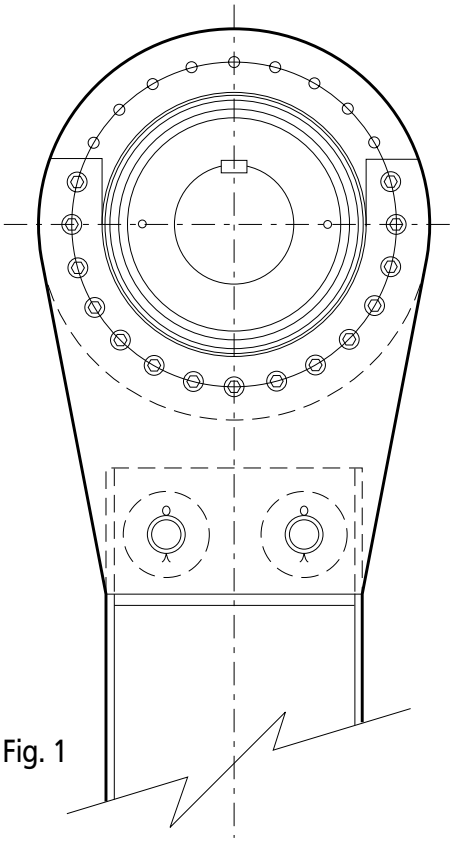


Fig. 1

There are many design variations of torque restraint arms to suit applicational demands.

The standard Renold holdback design is shown in Fig. 1 and the designs as Fig. 2 and Fig. 3 shows alternatives allowing interchangeability with other manufacturers.

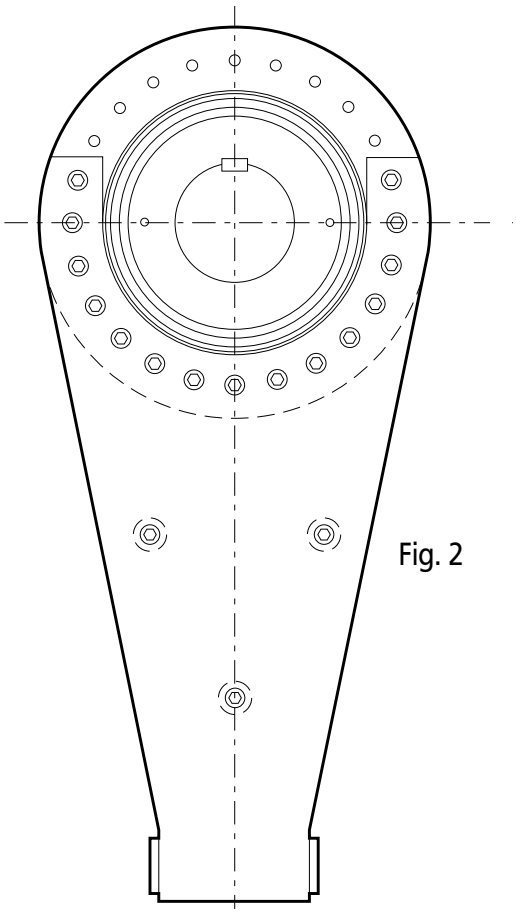


Fig. 2

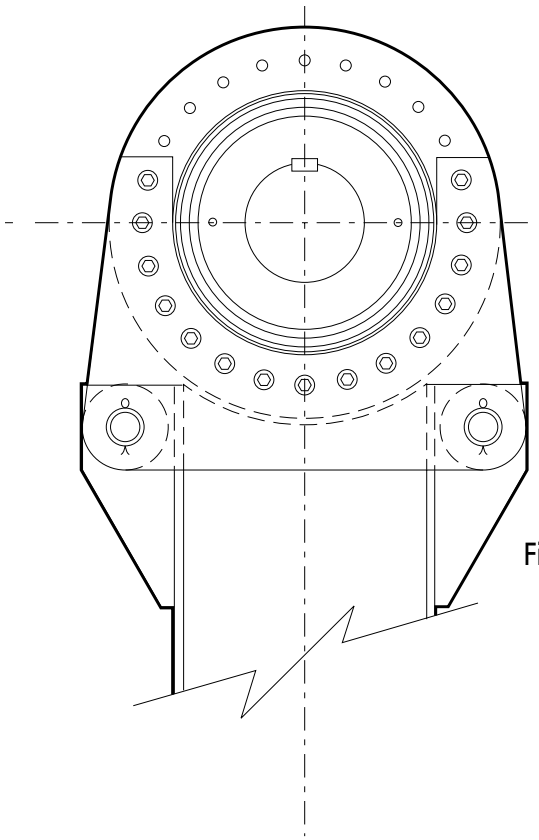
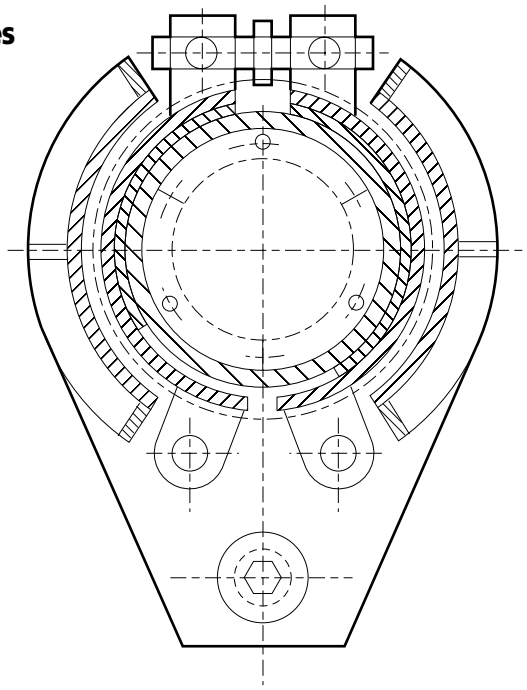
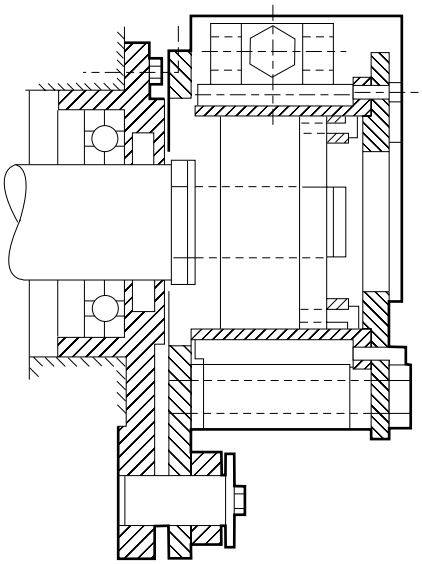


Fig. 3

Sprag Clutch Tension Release Mechanisms

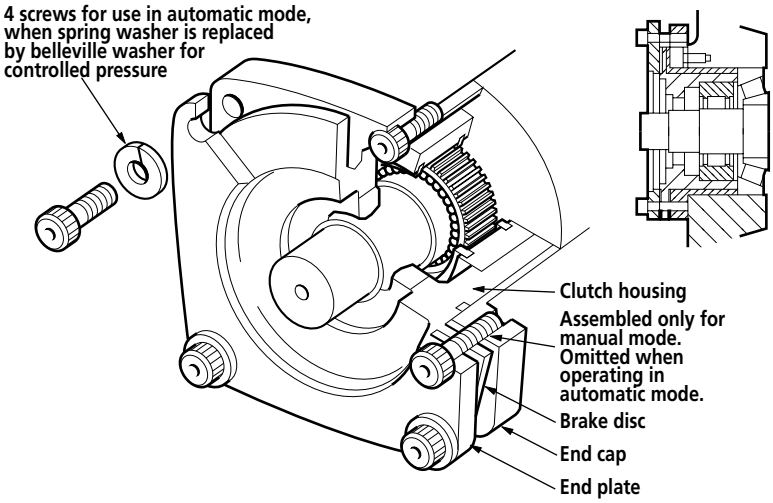
WA Series





The WA series Tension Release Mechanism is a Renold sprag clutch holdback contained within a housing which allows for the safe controlled release of tension on an inclined belt conveyor when needed or required.

TRM-I Series

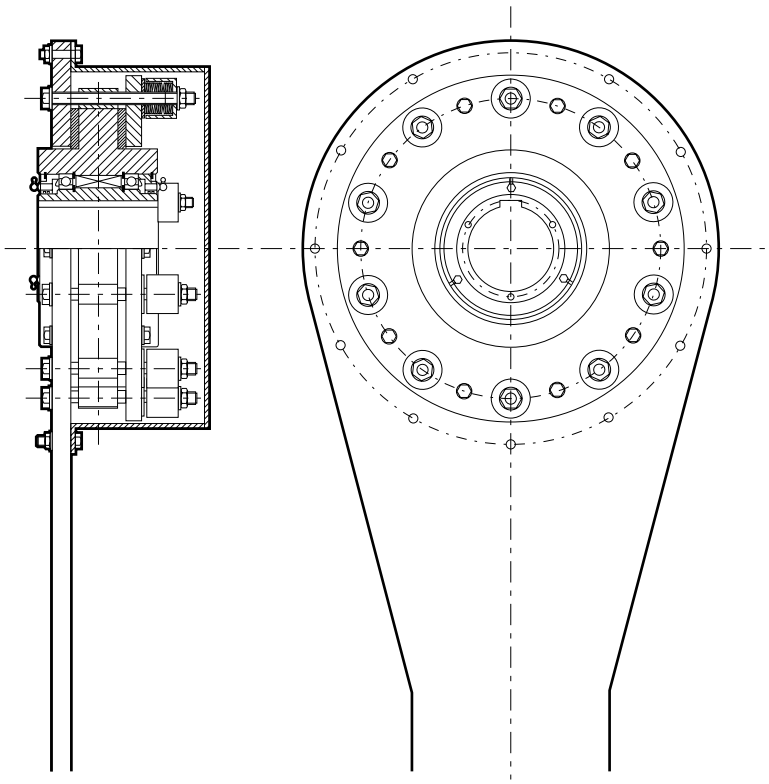


As clear extension to our other types of Tension Release Devices and the inclusion of many Renold Direct Mounted Sprag Clutches being used in gear boxes, we designed the TRM-I Device to compliment our range. Many features of this device include automatic Torque Limiting.

Being a custom designed device there are no external dimensions changes to your gear unit. The device is also designed with no modifications necessary to the gear or worm shaft, thus existing field units can be readily converted and no special tools are required to operate them.

They are suitable for single or multiple drive applications in the automatic mode and no lengthy preparation time is required prior to operation in the manual mode.

Torque Limiter - Sprag Clutch



The Renold sprag clutch torque limiter device is designed for use on applications where overload conditions are to be restricted to a design limit.

- Variable torque settings offer optimum clutch selection.
- Allows controlled torque release at point of jam-up.
- Available on all SO sprags clutch sizes for complete design flexibility.
- Enhanced seal clutches for low maintenance.
- Suitable for use on multi-point drives equalizing the load and allowing load sharing on all transmission parts.

RENOLD

American Standard Bore and Shaft Tolerances

American Inch Sizes		
Nominal Bore (in)	Bore (in)	Shaft (in)
0.500	0.499/0.500	0.499/0.498
0.625	0.624/0.625	0.624/0.623
0.750	0.749/0.750	0.749/0.748
0.875	0.874/0.875	0.874/0.873
1.000	0.999/1.000	0.999/0.998
1.125	1.124/1.125	1.124/1.123
1.250	1.249/1.250	1.249/1.248
1.312	1.311/1.312	1.311/1.310
1.375	1.374/1.375	1.374/1.373
1.500	1.499/1.500	1.499/1.498
1.625	1.624/1.625	1.624/1.623
1.750	1.749/1.750	1.749/1.748
1.875	1.8735/1.875	1.874/1.873
1.937	1.9365/1.9375	1.9365/1.9355
2.000	1.999/2.000	1.999/1.998
2.125	2.142/2.125	2.124/2.123
2.250	2.249/2.250	2.2485/2.2475
2.375	2.375/2.376	2.375/2.374
2.437	2.4360/2.4375	2.436/2.435
2.500	2.4985/2.500	2.4985/2.4975
2.625	2.624/2.625	2.624/2.623
2.687	2.6860/2.6875	2.686/2.685
2.750	2.7485/2.7500	2.7485/2.7475
2.937	2.9360/2.9375	2.9360/2.935
3.000	2.9985/3.0000	2.9985/2.9975
3.125	3.1235/3.1250	3.124/3.123
3.250	3.2485/3.2500	3.2485/3.2475
3.375	3.3735/3.3750	3.374/3.373
3.437	3.4360/3.4375	3.436/3.435
3.500	3.4985/3.5000	3.4985/3.4975
3.750	3.7485/3.7500	3.7485/3.7475
3.937	3.9360/3.9375	3.9355/3.9345
4.000	3.9985/4.0000	3.998/3.997
4.187	4.1860/4.1875	4.186/4.185
4.250	4.248/4.250	4.248/4.247
4.437	4.4360/4.4375	4.4355/4.4345
4.500	4.498/4.500	4.498/4.497
4.750	4.748/4.750	4.748/4.747
4.937	4.9355/4.9375	4.9355/4.9345
5.000	4998/5.000	4.998/4.997
5.250	5.248/5.250	5.248/5.247
5.437	5.435/5.437	5.435/5.434
5.500	5.498/5.500	5.498/5.497
5.750	5.748/5.750	5.748/5.747
5.937	5.9355/5.9375	5.9355/5.9345
6.000	5.998/6.000	5.998/5.997
6.250	6.248/6.250	6.248/6.247
6.437	6.4355/6.4375	6.4355/6.4345
6.500	6.498/6.500	6.498/6.497
6.750	6.748/6.750	6.478/6.747
6.875	6.873/6.875	6.873/6.872
6.937	6.9355/6.9375	6.9355/6.9345

American Inch Sizes		
Nominal Bore (in)	Bore (in)	Shaft (in)
7.000	7.000/6.998	6.998/6.997
7.500	7.504/7.506	7.503/7.502
7.750	7.754/7.756	7.753/7.752
8.000	8.004/8.006	8.003/8.002
8.250	8.254/8.256	8.253/8.252
8.500	8.504/8.506	8.503/8.502
8.750	8.574/8.756	8.753/8.752
9.000	9.004/9.006	9.003/9.002
9.250	9.254/9.256	9.253/9.252
9.500	9.504/9.506	9.503/9.502
9.750	9.754/9.756	9.753/9.752
10.000	10.004/10.006	10.006/10.002
10.250	10.254/10.256	10.253/10.252
10.500	10.504/10.506	10.503/10.502
10.750	10.754/10.756	10.753/10.752
11.000	11.004/11.006	11.003/11.002
11.500	11.504/11.506	11.503/11.502
12.000	12.004/12.006	12.003/12.001
12.250	12.254/12.256	12.253/12.251
12.500	12.504/12.506	12.503/12.501
13.000	13.004/13.006	13.003/13.001
13.250	13.254/13.256	13.253/13.251
13.500	13.504/13.506	13.503/13.501
13.750	13.754/13.756	13.753/13.751
14.000	14.004/14.006	14.003/14.001
14.250	14.254/14.256	14.253/14.251
14.500	14.504/14.506	14.503/14.501
14.750	14.754/14.756	14.7553/14.751
15.000	15.004/15.006	15.003/15.001
15.250	15.254/15.256	15.253/15.251
15.500	15.504/15.506	15.503/15.501
15.750	15.754/15.756	15.753/15.751
16.000	16.004/16.007	16.003/16.001
16.250	16.254/16.257	16.253/16.254
16.500	16.504/16.507	16.503/16.501
16.750	16.754/16.757	16.753/16.751
17.000	17.004/17.007	17.003/17.001
17.250	17.254/17.257	17.253/17.251
17.500	17.504/17.507	17.503/17.501
17.750	17.754/17.757	17.753/17.751
18.000	18.004/18.007	18.003/18.001
18.250	18.254/18.257	18.253/18.251
18.500	18.504/18.507	18.503/18.501
18.750	18.754/18.757	18.753/18.751
19.00	19.004/19.007	19.003/19.001
20.000	20.004/20.007	20.003/20.001

The above are suggested shaft tolerances only. Please confirm the proposed shaft tolerance at order stage.

Sprag Clutch Installation and Lubrication

Pre Installation Check

Shaft Fit

Standard bore limits are H8 for Light Duty Clutches and H7 for other clutches. Recommended shaft limits are h6 for all clutches, except SH series where g7 should be used.
However, an interference not exceeding 0.025 mm on diameter is acceptable for indexing clutches

Check clutch for direction of rotation

Outer Race

The clutches are designed to provide efficient means of connecting them to other equipment without involving an interference fit on the outside diameter of the outer race. Any equipment which locates from the outer race should have a clearance fit of 0.025mm minimum.

Key and Keyway

Parallel keys with top clearance only must be used; under no circumstances are taper keys acceptable.

It is recommended that a hardened key is used, made from 0.55/0.6% carbon steel and heat-treated to a hardness of HRC 25 - 40 (HV30 260 - 380). (it is assumed that the keyway in the shaft conforms to P9 or Js9 limits as specified by British and ISO Standards.)

In cases where the key has not been hardened it can be individually fitted and a side interence of up to 0.025mm is recommended.
There should be a small clearance between the top of the key and the keyway in the clutch bore. It is good practice to provide a tapped hole in the outboard end of the key to facilitate withdrawal.
The length of the key should not be less than the length of the clutch bore.

Renold do not supply shaft keys, unless specifically requested to do so.

Type of Lubrication

OIL LUBRICATED CLUTCHES are fitted with filler plugs and must be completely filled for indexing; half filled for over-running or backstopping.

GREASE LUBRICATED CLUTCHES are fitted with grease nipples and must be completely filled.

CLUTCHES WITHOUT SEALS are intended for immersion in an oil bath.

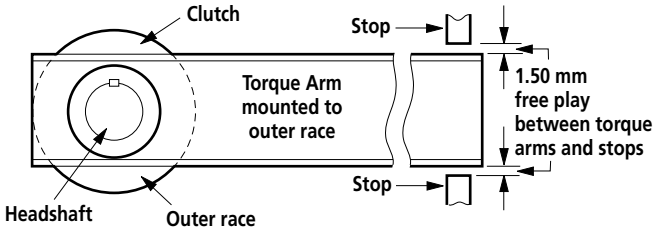
CLUTCHES REF NO SA02, SA04, SA05 and SB3 are supplied pre-lubricated with grease which is intended to last for the life of the clutch.

Concentricity

Concentricity of the sprag tracks of Sleeve Bearing Clutches is achieved by using the shaft on which the clutch is mounted as a bearing surface. The surface finish should not exceed 30 micro inch CLA and taper should not exceed 0.01mm per 25mm of journal length.

Torque Arms (Backstopping Clutches)

Bolt torque arms to clutch and check that they are not restrained sideways and that there is a total clearance between each arm and the stops of 3mm as shown in diagram.



LUBRICATION

Correct lubrication and maintenance are the most important factors for trouble free operation. Under no circumstances should lubricant be used containing EP additives. For alternatives to the following recommendations consult Renold

OVERRUNNING AND BACKSTOPPING

	TEMPERATURE RANGE	
MANUFACTURER	-7°C/65°C	-40°C/65°C
	OIL LUBRICATION	
MOBIL	DTE HEAVY MEDIUM	VELOCITE No 6
SHELL	TELLUS 68	TELLUS 10
	GREASE LUBRICATION	
MOBIL	MOBIL GREASE MP	MOBIL GREASE MP
SHELL	ALBIDA R2	ALBIDA R2
FUCHS	RENOLIT MP2	RENOLIT MP2

INDEXING

	INDEX SPEED	
MANUFACTURER	UP TO 150 STROKES/MIN	OVER 150 STROKES/MIN
MOBIL	DTE OIL LIGHT	VELOCITE No 10
SHELL	TELLUS 32	TELLUS 22

For indexing applications the preferred clutch lubricant is oil. If grease is to be used consult Renold. Oil lubricated clutches are supplied empty of oil and must be filled in accordance with the instructions supplied with the clutch. For applications outside the above parameters consult Renold.

Sprag Clutch Reconditioning Service

No attempt should be made to dis-assemble or repair a Sprag Clutch in the field. It is a precision made device which cannot be adequately reconditioned except under factory conditions of production, quality control and testing.

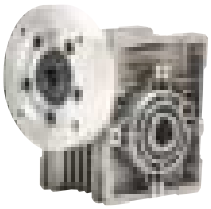
The Renold Sprag Clutch Reconditioning Service provides for the complete reconditioning of the clutch to bring it to an as new condition.

The service is not available for the Light Duty Series Clutches nor for Sleeve Bearing Clutches SB3 (648 104/5)

RENOLD

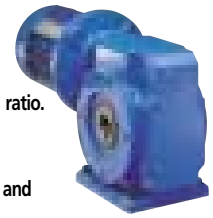
Gears and Variable Speed Product Range

RENOLD e.JM Series JW Type



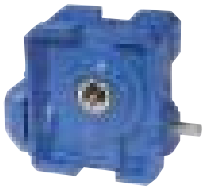
- Wormgear unit in sizes 30 to 86mm centre distance, up to 4kW capacity.
- Motorised and speed reducer types available.
- Suitable for standard IEC, NEMA and high efficiency EFF motors.
- Wide ratio range up to 100:1 single reduction and 4000:1 double reduction.
- Aluminium gear case up to size JW60 and fine grain cast iron to size 86.

RENOLD e.JM Series PM Type



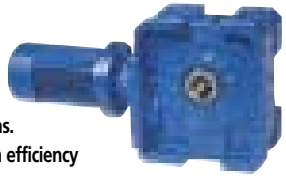
- Wormgear units with sizes from 1.125" to 3.0" centre distance, up to 4kW capacity.
- Available as worm or helical/worm options up to 300:1 ratio.
- Motorised and speed reducer types available.
- Variable mounting options allow design flexibility.
- Unique Holroyd tooth form profile for high efficiency and long life.
- Long life synthetic lubricant.

RENOLD e.PM Series PW Type



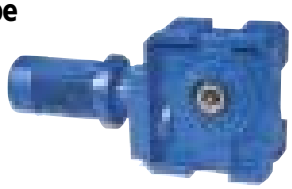
- Wormgear unit in 6 sizes with powers up to 45Kw capacity.
- Available as speed reducer or motorised versions.
- Ratios from 5:1 to 70:1.
- Unique Holroyd tooth form profile for high efficiency and long life.

RENOLD e.PM Series PH Type



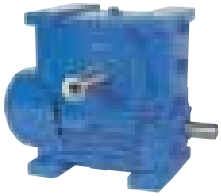
- Helical wormgear unit offering 6 sizes with ratios up to 300:1.
- Available as speed reducer or motorised versions.
- Heavy duty unit for demanding applications.
- Unique Holroyd tooth form profile for high efficiency and long life.
- Variable mounting allows total design flexibility.

RENOLD e.PM Series PB Type



- Helical/Bevel/Helical unit with high gear ratio and large torque range up to 12000 Nm.
- Available as speed reducer or motorised versions.
- Ratios from 20:1 to 160:1.
- Robust case and gear construction allowing use in heavy duty applications.

RENOLD WM Series

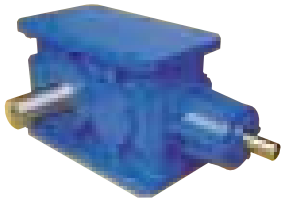


- WM Series is available with 4" - 9" centres and ratios of 5:1 to 70:1 as a single reduction unit and 75:1 to 4900:1 as a double reduction. Foot, flange and shaft mounted types available.
- Heavy duty version for demanding applications.
- Unique Holroyd tooth form for high efficiency and product life.
- Integral sprag clutch holdback for safe running.

RENOLD TW Series

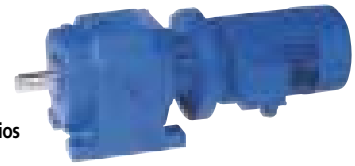
- Heavy duty worm units with centres from 10" to 28" in single and reduction types. Ratios available from 5:1 to 4900:1 with input powers from 16 to 506kW.
- Heavy duty design for high torque applications.
- Unique Holroyd tooth form for high efficiency and product life.
- Optional protection for use in hostile and arduous environments.

RENOLD HC Series



- Helical and bevel/helical units available in 14 sizes up to 1000kW.
- Heavy duty design for high torque applications.
- Gear case hardened and ground for high efficiency and quiet running.
- Hollow and solid shaft variants allow design options.

RENOLD RP Series

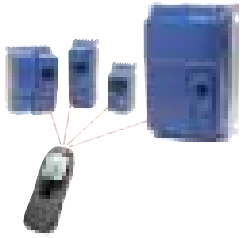


- In-line helical speed reducers and geared motor units available in single, double and triple reduction types from 0.25kW to 45kW with ratios from 1:5:1 to 100:1.
- Designed to European standard, therefore interchangeable without re-engineering.
- Foot and flange mounting for flexibility in applications.
- Standard heavy-duty version for higher load characteristics.

RENOLD SMX[tra]

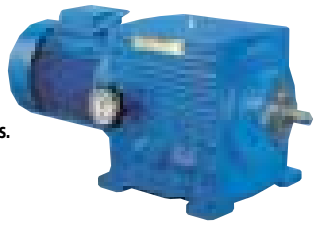
- Shaft mounted speed reducers available as single reduction units with 5:1 ratios and double units with ratios of 13:1, 20:1, 25:1 metric and 15:1 North American.
- Interchangeable to allow fast and easy replacement.
- Robust construction ideal for heavy-duty applications.
- Wide ratio range gives competitive size selections.
- Parallel and taper bore options allow easy removal for repair.
- Sprag clutch backstop available to prevent drive reversal.
- Enhance seal arrangements for use in hostile environments.

RENOLD Carter AC Inverter - Optidrive



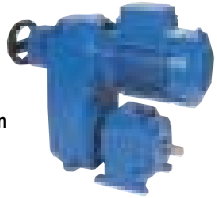
- Available as digital control and as a multi parameter facility covering most of the control requirements, with a power range of 0.37kW to 55kW.

RENOLD Carter Variator



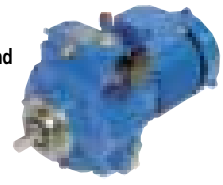
- Hydrostatic variable speed drives with a 27:1 speed range and capacities up to 22kW.
- Proven reliability in hazardous environments.
- Accurate speed holding.
- High starting torque (200% FLT).
- Built in overload protection.

RENOLD Carter Belt Variator



- Variable speed range of up to 8.75:1 and a power capacity up to 110kW.
- Suitable for operating in most hostile and explosion proof areas.
- Available with universal mounting to allow design flexibility.

RENOLD Carter Disc Variator



- Disc variable speed drive unit with 5:1 speed range and up to 4kW power capacity.
- Excellent speed holding characteristics under full load conditions.
- Variable mounting options allow design flexibility.

Couplings and Clutches Product Range

RENOLD Pinflex

- A robust general purpose pin/buffer coupling providing reliable fail safe transmission of torque and misalignment capability.
- Steel half bodies, strong yet compact.
- Polyurethane buffers, reliable/flexible and temperature resistant.
- Torsionally flexible and shock absorbing, extending machine life.

RENOLD Spiderflex

- A medium power torsionally flexible coupling combining shock absorbing and mis-alignment capacity for use in the widest range of industries and applications.
- Mis-alignment capabilities allow flexibility in installation.
- Optional fire retardant anti static element for use in flameproof environment.
- High torque capacity, yet compact design.
- Taper bush and multiple bore options mean reduced stock.

RENOLD Tyreflex

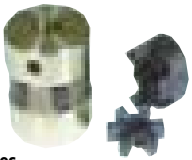
- A range of highly flexible couplings offering excellent mis-alignment capacity and suitable to absorb both shock loads and vibrations.
- Standard fire retardant, anti static elements up to size TY100.
- Interchangeability means no re-engineering.
- Pump spacer option for easy pump maintenance.

RENOLD Discflex

A general purpose fail safe, torsionally flexible coupling offering the option of either urethane or reinforced rubber disc, as the flexible element.

- Compact design, dimensionally small, yet high power capacity.
- Taperbush bores available for ease of maintenance.
- Optional fire retardant, anti static disc element for use in flameproof areas.

RENOLD Spider



- Compact coupling available with cast iron or bronze half bodies up to 107nm capacity.
- Torsionally flexible and shock absorbing for extended machine life.
- Bronze half bodies for use in corrosive atmospheres.

RENOLD Chainflex

- An all metal flexible coupling providing a high torque capacity with compact design.
- Torsionally stiff for use as a positive drive connection.
- Easy installation for ease of maintenance.
- Mis-alignment capacity up to 0.50mm offset and 4mm end float.

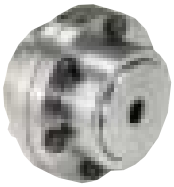
RENOLD Crown Pin

- An established pin/buffer coupling offering extended power capacity where the demand for long life and simplicity of construction make it suitable for working in arduous conditions.
- Heavy-duty pin and buffer coupling suitable for shock loads.
- Neoprene buffers for robust flexibility.
- Mis-alignment capabilities of up to 0.25° angular and 0.13-0.18mm parallel offset.

RENOLD Rigid

- An all steel, rigid, flanged coupling used where no shaft flexibility is required.
- Small compact design with high torque capacity.
- Taper bushed, multiple bore options mean reduced stock.

RENOLD Gearflex



- Heavy duty all metal couplings giving maximum power capacity within minimum space envelope and excellent mis-alignment capability.
- Single and double arrangement, standard and heavy-duty series types up to 60,000kW capacity.
- AGMA standard, therefore interchangeable and cost effective.
- Crowned and barrelled teeth for optimum contact and long life.
- Mill motor, sheer pin and telescopic designs to give design suitability for demanding applications.

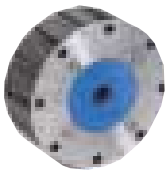
RENOLD Hydrastart

- A fluid coupling suitable for soft starting high inertia machinery with reduced current demand, controlled acceleration and torque with drive overload protection.
- Fluid soft start available up to 700kW.
- Flexible couplings and vee pully designs as standard for design flexibility.
- Soft start allows the motor to accelerate on low load.
- Allows use of standard squirrel cage motors.
- Delay fill version extends acceleration time and reduces start up torque.

RENOLD Sprag Clutch

- Anti-runback clutch used on holdback, indexing and over running applications.
- No backlash, giving positive action.
- Long life means low maintenance costs.
- Enhanced performance from optimised sprag profile design.
- Compact design, yet high torque.
- Interchangeability means no re-engineering.

RENOLD Air Clutches



- Air operated, disconnecting clutches available as elements only or as a coupling drive package.
- Constricting and expanding types activated by standard factory air supply.
- Clutch or brake types available for flexible design choice.
- Air flow control allowing reaction time to be adjusted, therefore protecting all machinery types.

RENOLD

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