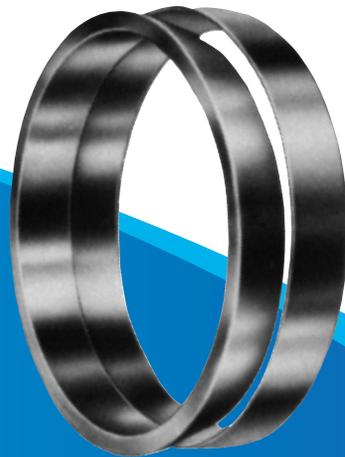


# RINGFEDER®

## KEYLESS SHAFT/HUB CONNECTIONS



LOCKING ASSEMBLIES™



LOCKING ELEMENTS™



SHRINK DISCS®



RINGFEDER®

W-300-2



# Ringfeder Corporation Catalog W-300-1 Shaft-Hub Locking Devices

Ringfeder® unique frictional, keyless shaft-hub locking devices provide an easily adjustable and releasable mechanical shrink-fit. They offer all the advantages of shrink-fits – without the problems. Torque or axial loads are transmitted by radial clamping pressures and friction between the functional surfaces of the locking device, shaft and hub.

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## Working Principle

Ringfeder® shaft-hub locking devices are based on the inclined plane or taper principle. Clamping forces generated by torqued up locking screws are translated into pre-determined contact pressures so as to create mechanical shrink-fit connections.

## Applications

Ringfeder® frictional shaft-hub locking devices have successfully solved shaft-hub connection problems involving:

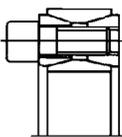
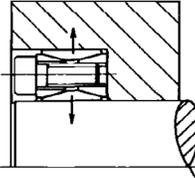
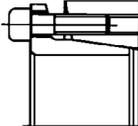
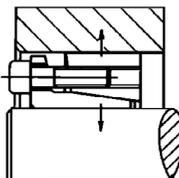
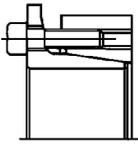
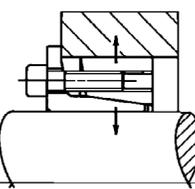
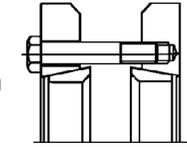
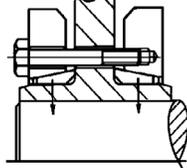
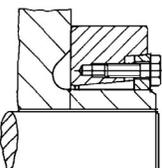
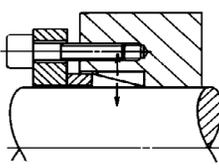
Gears	Rolls	Cams
Levers	Winches	Sprockets
Flanges	Couplings	Brake drums
Sheaves	Flywheels	Hand wheels
Clutches	Fan wheels	Worm gears
Bevel gears	Helical gears	Mixer shafts
Crane wheels	Bucket wheels	Pump impellers
Turbine rotors	Conveyer pulleys	Ship propellers
Windmill propellers	Rock-cutting heads	Shaft-mounted gear units

## Advantages

- Elimination of keys, keyways or splines and associated fitting costs
- Completely tight fit around shaft – no backlash
- Impervious to reversing, dynamic or shock loads
- Transmission of high torques and axial loads

## Benefits

- Reduced machining costs
- Easy installation, assembly and disassembly
- Easy axial and angular adjustments and timing

INTERNAL	 <p><b>Locking Assemblies™ RfN 7012</b> These are the original Ringfeder® Locking Assemblies™ featuring double-tapered thrust rings with self-releasing tapers. They bridge relatively large fit clearances, are easy to install, adjust or remove, but are not self-centering. A precentering hub section is usually required.</p>   <p>These units are most commonly used on applications in general engineering to transmit high torques and axial loads utilizing larger machining tolerances. <b>Available sizes:</b> INCH SERIES for shafts from 3/4" to 7.875" dia. METRIC SERIES for shafts from 20 mm to 1000 mm dia.</p>	2
	 <p><b>Locking Assemblies™ RfN 7013</b> These Locking Assemblies™ are of single-taper design with a self-locking taper providing good self-centering action and concentricity, as well as increased torque capacity. A precentering hub section is not required. Integral push-off screws for disassembly are provided. These assemblies are available in two types: Straight-thru type: RfN 7013.0 Flange type: RfN 7013.1 Flange type units fix the hub positively against their extended flange preventing axial movement during tightening.</p>   <p>Applied wherever self-centering action and good concentricity of mounted components are essential and hubs with straight-thru bores are used. <b>Available sizes:</b> INCH SERIES for shafts from 1" to 4" dia. METRIC SERIES for shafts from 20 mm to 150 mm dia.</p>	3
	 <p><b>Shrink Discs® RfN 4071, 4051, 4091</b> The Shrink Discs® are external locking devices installed over hub projections. By tightening the locking screws, the locking collars exert radial forces on the tapered ring and on the hub. After bridging the fit clearances, radial clamping pressure is generated between shaft and hub establishing a solid, frictional connection. For adjustment or removal, just unscrew the bolts.</p>   <p>Applied for transmission of very high torques, particularly when external clamping is advantageous and excellent concentricity is required. <b>Available sizes:</b> The Shrink Discs® accommodate both inch and metric shafts ranging from 0.75" to 34" dia.</p>	4
EXTERNAL	 <p><b>Split Shrink Discs® RfN 4071-SR, 4051-SR, 4091-SR</b> They are basically the standard Shrink Discs® with two separate half inner rings offering greater mounting versatility and allowing symmetrical hub designs. Split Shrink Discs® can also be used as Half Shrink Discs® transmitting half the catalog rated torque. Then, either clearance or tapered holes need to be provided in the hub for the locking screws.</p>  	5
	 <p><b>Shrink Discs® RfN 4171</b> This new RfN 4171 Shrink Disc® employs a single, long, shallow taper instead of opposing tapers of the traditional Ringfeder® three-piece series (RfN 4071). Better centering and concentricity result, making the Shrink Disc® especially suitable for high-speed applications where balance is critical.</p>  <p>Installation is also simplified. When the fasteners are properly torqued, the installer has a visual aid to indicate correct installation, i.e., the inner ring face should be flush with the outer ring face. <b>Available sizes:</b> Shafts from 3/4" to 16.5", and torques from 136 lb-ft to 860,000 lb-ft.</p>	6
	<p><b>Low Inertia Series Shrink Disc® for Small Shafts</b></p> <p>RfC Low Inertia Series Shrink Discs® Sizes 10 to 50 for smaller shaft sizes.</p>	7
	<p><b>Heavy Duty Shrink Discs® 4091 for Smaller Shafts</b></p>	7a
INTERNAL	 <p><b>Locking Elements™ RfN 8006/GSA</b> Locking Elements™ consist of an internal and an external tapered ring. When axial force is exerted on a set of Locking Elements™, radial clamping pressures are generated on the shaft and in the hub bore providing a frictional connection. Upon release of the clamping force, the hub can be adjusted or removed.</p>   <p>Applied for lower torques and smaller shafts. By varying the clamp force, number of Locking Element™ sets and clamping arrangements, different design configurations can be achieved. <b>Available sizes:</b> INCH sizes (GSA Series) for shafts from 1/4" to 3" dia. METRIC sizes (RfN 8006 Series) for shafts from 6 mm to 1000 mm dia.</p>	8
	<p><b>Low Profile Torque Wrenches</b></p>	9
	<p><b>The ABC's of Locking Devices</b></p>	10



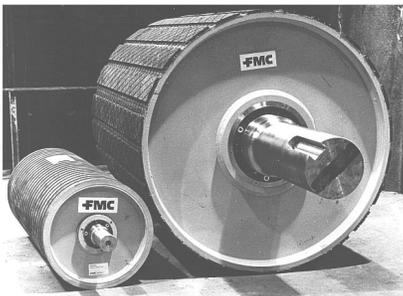
# Ringfeder® Locking Assemblies™

RfN 7012 & RfN 7012-IN

Ringfeder® Locking Assemblies™ are completely self-contained, frictional shaft-hub locking devices. Designed to generate an easily adjustable and releasable mechanical shrink-fit, they have been used successfully for many years in heavy-duty applications to transmit high torques and dynamic loads and to provide timing and releasability.



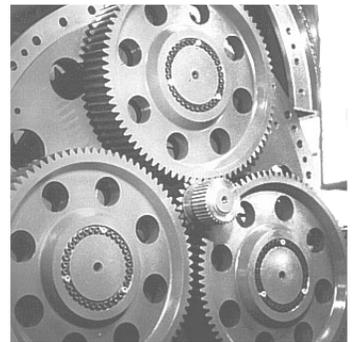
## Application Examples



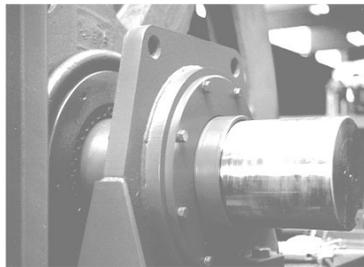
**Fig. 1: Drive Pulley**  
Drive pulley with 280 mm dia. (11.024") Locking Assemblies™ and bend pulley with 95 mm dia. (3.740") Locking Assemblies™.



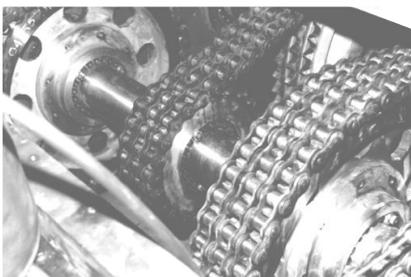
**Fig. 2: Lower Band Wheels**  
Lower band wheels of a twin band saw fastened with 7" RfN 7012-IN Locking Assemblies™.



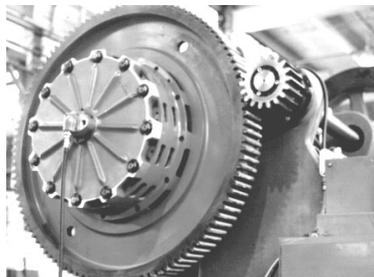
**Fig. 3: Gears**  
Gears fitted with RfN 7012 Locking Assemblies™.



**Fig. 5: Drive Pulley**  
Drive pulley of a gondola ski lift fastened with a 300 x 375 RfN 7012 Locking Assembly™.



**Fig. 4: Sprockets**  
Input shaft for 750 HP draw works showing applications of Locking Assemblies™ and adaptor flanges.



**Fig. 6: Pinion Gear**  
Pinion gear and flywheel both mounted with RfN 7012 Locking Assemblies™.



**Fig. 7: Cutter Heads**  
Cutter heads fastened with Locking Assemblies™.

- Determine the required shaft diameter (d) or maximum torque ( $M_t$ ) to be transmitted:

$$\text{Torque } M_t = \frac{5252 \times \text{HP}}{\text{RPM}} \quad (\text{lb-ft})$$

If combined torsional and axial loads are to be transmitted, calculate the resulting torque as follows:

$$M_{t \text{ res}} = \sqrt{M_t^2 + \left(\frac{P_{ax} \times d}{24}\right)^2} \leq M_{t \text{ cat}}$$

- $M_{t \text{ res}}$  = resultant torque to be transmitted
- $M_t$  = actual or maximum torque to be transmitted (lb-ft)
- $P_{ax}$  = axial load/thrust to be transmitted (lbs)
- $d$  = shaft diameter (inches)
- $M_{t \text{ cat}}$  = maximum transmissible torque (lb-ft) of Locking Assembly™ as specified

- Select a Locking Assembly™ for the shaft diameter (d) from the specification tables and verify that the corresponding maximum transmissible torque ( $M_t$ ) meets the torque requirement.

If torque is the primary requirement, select the necessary torque ( $M_t$ ) from the same specification tables and determine the corresponding shaft diameter (d).

*Note: Required peak torque should never exceed specified transmissible torque ( $M_t$ ).*

To increase transmissible torque ( $M_t$ ):

- Install 2 or 3 Locking Assemblies™ in series, increasing transmissible torque as follows:
    - with 2 Locking Assemblies™:  $M_{trans.} = 2 \times M_t$
    - with 3 Locking Assemblies™:  $M_{trans.} = 3 \times M_t$
 (see Fig. 8: Hub Layout and Fig. 9).  
 The hub must be long enough to accommodate the assemblies.
  - Increase screw tightening torque ( $M_A$ ) by up to 20%. Transmissible torque ( $M_t$ ) and contact pressures (p, p') increase proportionately.
- Determine the recommended minimum hub outside diameter ( $D_N$ ) for the Locking Assembly™ selected from the specification tables or calculate the hub outside diameter ( $D_N$ ) by using the following equation:

$$D_N \geq D \times \sqrt{\frac{YP + C_3 \times p'}{YP - C_3 \times p'}}$$

Where YP = yield point of hub material (lbs/sq.in.)

$p' = p \times d/D$  (lbs/sq.in.)

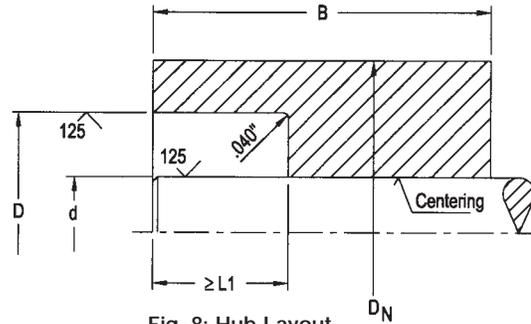
$B \geq \text{min. } 2 \times l$  (inches); see *Example*

$C_3 = 0.6$  (one locking assembly)

$C_3 = 0.8$  (2 or 3 Locking Assemblies™ in series)

- Verify that the hub length (B) is adequate for the selected Locking Assembly™; see *Example*.

- Check the applicable machining tolerance for the shaft and hub bore in the specification tables. A surface finish of 125 micro-inches for shafts and bores is generally adequate.
- Determine the required Locking Assembly™ by specifying the size (d x D) from Tables 1 & 2 followed by the series number, e.g.: 100 x 145 RfN 7012.



**Fig. 8: Hub Layout**

Typical layout for a Locking Assembly™ installation.

*Note: When accurate centering of the hub is required, establish a proper fit tolerance for the pilot or centering portion of the hub.*

## EXAMPLE

A spur gear is to be mounted on a 3.9375" dia. shaft capable of transmitting a peak torque of 5,750 lb-ft. The gear is made of 1040 AISI steel (Y.P. 36,000 psi). Select the proper Locking Assembly™ and determine the required hub dimensions and proper machining tolerances.

- The shaft diameter is specified at 3.9375".
- The specification tables indicate that a 3-15/16 Locking Assembly™ is capable of transmitting a torque ( $M_t$ ) of 6,944 lb-ft, more than the required amount. Select the 3-15/16 Locking Assembly™.
- The specification tables indicate that the selected 3-15/16 Locking Assembly™ requires a minimum hub outer diameter of 8.000" based on Y.P. 36,000 psi hub material.
- The hub length (B) should be  $2 \times L_1$ . Fig. 8 indicates that  $L_1 = 1.852"$ . Therefore,  $B = 2 \times 1.852" = 3.704"$  (minimum).

Since the gear must be concentric within .0025", specify the following fit tolerance for the pilot bore:

shaft: 3.9375/3.9365"  
 bore: 3.9375/3.9390"

- According to the specification tables, the machining tolerances for the selected Locking Assembly™ are as follows:
  - shaft: +.000/-.0035"
  - counter bore: -.000/+.0035"

However, because of the concentricity requirements for the gear, tighter tolerances are needed for the shaft and pilot bore.

The counter bore tolerances for the Locking Assembly™ are -.0000/+.0025" (within the permissible limits and in accordance with the fit tolerance specified in Step 4 above).

- Order the following assembly:

	Size	RfN	Series
Metric:	100 x 145	RfN	7012
Inch:	3-15/16	RfN	7012-IN

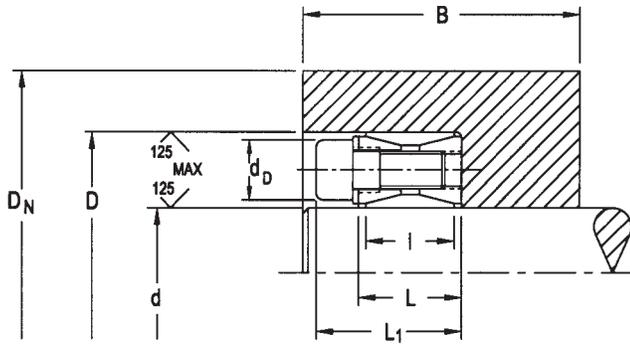


Fig. 9

- $d$  = nominal Locking Assembly™ I.D.  
 = shaft O.D.  
 $T_1$  = machining tolerances for shaft ( $d$ )  
 $D$  = nominal Locking Assembly™ O.D.  
 = hub counter bore I.D.  
 $T_2$  = machining tolerances for counter bore ( $D$ )  
 $L, I, L_1$  = width dimensions, relaxed condition  
 $M_t$  = maximum transmissible torque  
 $p$  = contact pressure between Locking Assembly™ and shaft  
 $d_G$  = metric socket head cap screw size  
 $s$  = metric hex key size (across flats)  
 $M_A$  = required tightening torque per locking screw (tighten with torque wrench)  
 $d_D$  = metric pull-out thread (under zinc-plated screws only)  
 $D_N$  = minimum hub O.D. for single-unit installation and based on Y.P. 36,000 psi hub material (for other hub materials calculate hub O.D. per step 3 of Selection Guide)

**Table 1: Inch Series Locking Assembly™ RfN 7012-IN**  
 Material: Medium Carbon Steel\*

RfN 7012-IN Size	Locking Assembly™ dimensions							max. $M_t$ lb-ft	$p$ psi	Locking screws DIN 912 – 12.9					$D_N$ inches
	$d$	$T_1$	$D$	$T_2$ inches	$L$	$I$	$L_1$			Qty.	size $d_G$	$s$ mm	$M_A$ lb-ft	$d_D$	
3/4	.750	+0	1.850	-0	.787	.669	1.083	185	28 450	8 M	6x18	5	10.13	M 8	2.375
1	1.000	-.002	1.969	+.002	.787	.669	1.083	275	27 000	9 M	6x18	5	10.13	M 8	2.500
1-1/8	1.125		2.165		.787	.669	1.083	345	23 720	10 M	6x18	5	10.13	M 8	2.750
1-3/16	1.1875		2.159		.813	.669	1.108	362	24 900	10 M	6x18	5	10.13	M 8	2.750
1-1/4	1.250		2.362		.787	.669	1.083	459	28 000	12 M	6x18	5	10.13	M 8	3.125
1-3/8	1.375		2.365		.776	.669	1.071	506	25 600	12 M	6x18	5	10.13	M 8	3.125
1-7/16	1.4375		2.559		.787	.669	1.083	608	28 450	15 M	6x18	5	10.13	M 8	3.375
1-1/2	1.500	+0	2.559	-0	.787	.669	1.083	636	27 000	15 M	6x18	5	10.13	M 8	3.375
1-5/8	1.625	-.0025	2.953	+.0025	.945	.787	1.319	1 070	32 700	12 M	8x22	6	25.32	M 10	4.125
1-11/16	1.6875		2.953		.945	.787	1.319	1 109	28 430	12 M	8x22	6	25.32	M 10	4.125
1-3/4	1.750		2.953		.945	.787	1.319	1 150	30 000	12 M	8x22	6	25.32	M 10	4.125
1-7/8	1.875		3.150		.945	.787	1.319	1 222	28 450	12 M	8x22	6	25.32	M 10	4.250
1-15/16	1.9375		3.150		.945	.787	1.319	1 259	27 000	12 M	8x22	6	25.32	M 10	4.250
2	2.000		3.346		.945	.787	1.319	1 519	30 600	14 M	8x22	6	25.32	M 10	4.750
2-1/8	2.125		3.346		.945	.787	1.319	1 613	29 150	14 M	8x22	6	25.32	M 10	4.750
2-3/16	2.1875		3.543		.945	.787	1.319	1 656	28 450	14 M	8x22	6	25.32	M 10	4.875
2-1/4	2.250		3.543		.945	.787	1.319	1 700	27 000	14 M	8x22	6	25.32	M 10	4.875
2-3/8	2.375		3.531		.996	.787	1.370	1 787	25 600	14 M	8x22	6	25.32	M 10	4.875
2-7/16	2.4375		3.740		.945	.787	1.319	2 098	28 450	16 M	8x22	6	25.32	M 10	5.250
2-1/2	2.500	+0	3.740	-0	.945	.787	1.319	2 148	27 750	16 M	8x22	6	25.32	M 10	5.250
2-9/16	2.5625	-.003	3.737	+.003	.959	.787	1.333	2 199	27 000	16 M	8x22	6	25.32	M 10	5.250
2-5/8	2.625		4.331		1.102	.945	1.555	3 120	30 514	14 M	10x25	8	50.63	M 12	5.937
2-11/16	2.6875		4.331		1.102	.945	1.555	3 195	29 804	14 M	10x25	8	50.63	M 12	5.937
2-3/4	2.750		4.337		1.079	.945	1.532	3 320	29 850	14 M	10x25	8	50.63	M 12	6.000
2-7/8	2.875		4.528		1.102	.945	1.555	3 450	28 450	14 M	10x25	8	50.63	M 12	6.250
2-15/16	2.9375		4.528		1.102	.945	1.555	3 522	27 750	14 M	10x25	8	50.63	M 12	6.250
3	3.000		4.724		1.102	.945	1.555	3 580	27 000	14 M	10x25	8	50.63	M 12	6.375
3-1/8	3.125		4.724		1.102	.945	1.555	3 731	25 400	14 M	10x25	8	50.63	M 12	6.375
3-1/4	3.250		4.921		1.102	.945	1.555	4 426	26 950	16 M	10x25	8	50.63	M 12	6.875
3-3/8	3.375		4.921		1.102	.945	1.555	4 593	27 750	16 M	10x25	8	50.63	M 12	6.875
3-7/16	3.4375		5.118		1.102	.945	1.555	4 629	26 300	16 M	10x25	8	50.63	M 12	7.125
3-1/2	3.500	+0	5.118	-0	1.102	.945	1.555	4 716	25 600	16 M	10x25	8	50.63	M 12	7.125
3-3/4	3.750	-.0035	5.305	+.0035	1.142	.945	1.594	5 714	27 750	18 M	10x25	8	50.63	M 12	7.500
3-15/16	3.9375		5.708		1.301	1.024	1.852	6 944	27 750	14 M	12x30	10	90.41	M 14	8.000
4	4.000		5.843		1.299	1.024	1.850	7 016	27 000	14 M	12x30	10	90.41	M 14	8.375
4-7/16	4.4375		6.496		1.299	1.024	1.850	8 897	28 450	16 M	12x30	10	90.41	M 14	9.125
4-1/2	4.500		6.496		1.299	1.024	1.850	9 027	27 750	16 M	12x30	10	90.41	M 14	9.125
4-15/16	4.9375		7.087		1.496	1.339	2.047	12 282	24 200	20 M	12x35	10	90.41	M 14	9.500
5	5.000		7.087		1.496	1.339	2.047	12 434	24 200	20 M	12x35	10	90.41	M 14	9.500
5-1/2	5.500	+0	7.492	-0	1.449	1.339	2.000	15 088	24 200	22 M	12x35	10	90.41	M 14	10.250
6	6.000	-.004	8.268	+.004	1.496	1.339	2.047	19 290	25 600	26 M	12x35	10	90.41	M 14	11.500
6-1/2	6.500		8.858		1.732	1.496	2.362	23 037	23 450	22 M	14x40	12	137.43	M 16	12.000
7	7.000		9.252		1.732	1.496	2.362	27 008	23 450	24 M	14x40	12	137.43	M 16	12.750
7-1/2	7.500	+0	9.823	-0	2.126	1.811	2.756	33 633	21 350	28 M	14x45	12	137.43	M 16	13.125
7-7/8	7.875	-.0045	10.235	+.0045	2.051	1.811	2.681	37 973	21 350	30 M	14x45	12	137.43	M 16	13.625

\*Stainless steel available upon request.

**Notes:**  $B$  = at least  $2 \times I$ , preferably  $2 \times L_1$  or more  
 $P_{ax}$  = axial load (thrust capacity)  
 =  $\frac{M_t \times 24 \text{ lbs}}{d}$  (for  $M_t$  in lb-ft)

$p'$  = constant pressure between Locking Assembly™ and hub bore  
 Values of  $M_t$ ,  $p$ ,  $P_{ax}$ , and  $p'$  are based on lightly oiled installation (coefficient of friction  $\mu = 0.12$ )

$$p' = p \times \frac{d}{D}$$

# Metric Series Locking Assemblies™ RfN 7012 Specifications



**Table 2: Metric Series Locking Assembly™ RfN 7012**

Material: Medium Carbon Steel\*

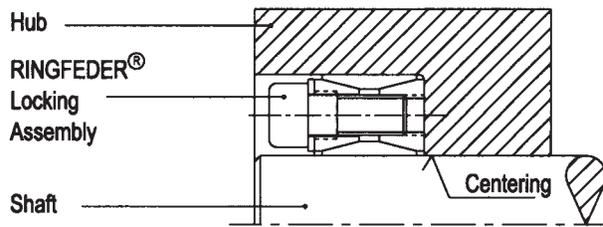
RfN 7012 Size mm	Locking Assembly™ dimensions							max. M <sub>t</sub> lb-ft	p psi	Locking screws DIN 912 – 12.9				
	d	T <sub>1</sub>	D	T <sub>2</sub> inches	L	I	L <sub>1</sub>			Qty.	size d <sub>G</sub>	s mm	M <sub>A</sub> lb-ft	d <sub>D</sub>
20 x 47	.787	↑	1.850	↑	.787	.669	1.083	195	29 850	8 M 6x18	5	10.13	M 8	2.375
22 x 47	.866	+0	1.850	-0	.787	.669	1.083	217	27 750	8 M 6x18	5	10.13	M 8	2.375
24 x 50	.945	↓	1.969	+0.002	.787	.669	1.083	260	27 750	9 M 6x18	5	10.13	M 8	2.500
25 x 50	.984	↓	1.969	↓	.787	.669	1.083	275	27 000	9 M 6x18	5	10.13	M 8	2.500
28 x 55	1.102	↑	2.165	↑	.787	.669	1.083	340	26 300	9 M 6x18	5	10.13	M 8	2.750
30 x 55	1.181	↑	2.165	↑	.787	.669	1.083	362	24 900	9 M 6x18	5	10.13	M 8	2.750
32 x 60	1.260	↑	2.362	↑	.787	.669	1.083	456	26 397	12 M 6x18	5	10.13	M 8	3.125
35 x 60	1.378	+0	2.362	-0	.787	.669	1.083	506	25 600	12 M 6x18	5	10.13	M 8	3.125
38 x 65	1.496	↓	2.559	+0.0025	.787	.669	1.083	630	27 628	15 M 6x18	5	10.13	M 8	3.375
40 x 65	1.575	↓	2.559	↓	.787	.669	1.083	665	25 600	15 M 6x18	5	10.13	M 8	3.375
42 x 75	1.654	↓	2.953	↓	.945	.787	1.319	1 085	32 634	12 M 8x22	6	25.32	M 10	4.125
45 x 75	1.772	↓	2.953	↓	.945	.787	1.319	1 165	29 850	12 M 8x22	6	25.32	M 10	4.125
48 x 80	1.890	↓	3.150	↓	.945	.787	1.319	1 230	28 428	12 M 8x22	6	25.32	M 10	4.250
50 x 80	1.969	↓	3.150	↓	.945	.787	1.319	1 280	27 000	12 M 8x22	6	25.32	M 10	4.250
55 x 85	2.165	↑	3.346	↑	.945	.787	1.319	1 642	28 450	14 M 8x22	6	25.32	M 10	4.750
60 x 90	2.362	↑	3.543	↑	.945	.787	1.319	1 787	25 600	14 M 8x22	6	25.32	M 10	4.875
65 x 95	2.559	+0	3.740	-0	.945	.787	1.319	2 199	27 000	16 M 8x22	6	25.32	M 10	5.250
70 x 110	2.756	↓	4.331	+0.003	1.102	.945	1.555	3 327	29 850	14 M 10x25	8	50.63	M 12	6.000
75 x 115	2.953	↓	4.528	↓	1.102	.945	1.555	3 544	27 750	14 M 10x25	8	50.63	M 12	6.250
80 x 120	3.150	↓	4.724	↓	1.102	.945	1.555	3 761	25 600	14 M 10x25	8	50.63	M 12	6.375
85 x 125	3.346	↑	4.921	↑	1.102	.945	1.555	4 557	27 750	16 M 10x25	8	50.63	M 12	6.875
90 x 130	3.543	↑	5.118	↑	1.102	.945	1.555	4 774	25 600	16 M 10x25	8	50.63	M 12	7.125
95 x 135	3.740	+0	5.315	-0	1.102	.945	1.555	5 714	27 750	18 M 10x25	8	50.63	M 12	7.500
100 x 145	3.937	↓	5.709	+0.0035	1.229	1.024	1.850	6 944	27 750	14 M 12x30	10	90.41	M 14	8.000
110 x 155	4.331	↓	6.102	↓	1.229	1.024	1.850	7 595	25 600	14 M 12x30	10	90.41	M 14	8.375
120 x 165	4.724	↓	6.496	↓	1.229	1.024	1.850	9 475	26 300	16 M 12x30	10	90.41	M 14	9.125
130 x 180	5.118	↑	7.087	↑	1.496	1.339	2.047	12 730	23 450	20 M 12x35	10	90.41	M 14	9.500
140 x 190	5.512	↑	7.480	↑	1.496	1.339	2.047	15 117	23 450	22 M 12x35	10	90.41	M 14	10.250
150 x 200	5.906	+0	7.874	-0	1.496	1.339	2.047	17 504	24 200	24 M 12x35	10	90.41	M 14	10.750
160 x 210	6.299	↓	8.268	+0.004	1.496	1.339	2.047	20 252	24 200	26 M 12x35	10	90.41	M 14	11.500
170 x 225	6.693	↓	8.858	↓	1.732	1.496	2.362	23 724	22 750	22 M 14x40	12	137.43	M 16	12.000
180 x 235	7.087	↓	9.252	↓	1.732	1.496	2.362	27 341	23 750	24 M 14x40	12	137.43	M 16	12.750
190 x 250	7.480	↑	9.843	↑	2.047	1.811	2.677	33 633	21 350	28 M 14x45	12	137.43	M 16	13.125
200 x 260	7.874	+0	10.236	-0	2.047	1.811	2.677	37 973	21 350	30 M 14x45	12	137.43	M 16	13.625
220 x 285	8.661	↓	11.220	+0.0045	2.205	1.969	2.913	49 184	21 350	26 M 16x50	14	213.37	M 20	15.000
240 x 305	9.449	↓	12.008	↓	2.205	1.969	2.913	61 842	22 750	30 M 16x50	14	213.37	M 20	16.500
260 x 325	10.236	+0	12.795	-0	2.205	1.969	2.913	75 223	23 450	34 M 16x50	14	213.37	M 20	17.750
280 x 355	11.024	↓	13.976	+0.005	2.598	2.362	3.406	92 582	20 600	32 M 18x60	14	292.94	M 22	18.625
300 x 375	11.811	↓	14.764	↓	2.598	2.362	3.406	110 665	21 350	36 M 18x60	14	292.94	M 22	20.000
320 x 405	12.598	↑	15.945	↑	3.071	2.835	3.957	151 893	21 350	36 M 20x70	17	419.51	M 24	21.500
340 x 425	13.386	+0	16.732	-0	3.071	2.835	3.957	162 019	20 600	36 M 20x70	17	419.51	M 24	22.250
360 x 455	14.173	↓	17.913	+0.0055	3.543	3.307	4.567	212 650	20 600	36 M 22x80	17	564.17	M 27	23.875
380 x 475	14.961	↓	18.701	↓	3.543	3.307	4.567	222 776	19 200	36 M 22x80	17	564.17	M 27	24.625
400 x 495	15.748	↓	19.488	↓	3.543	3.307	4.567	232 903	18 500	36 M 22x80	17	564.17	M 27	25.250
420 x 515	16.535	↑	20.276	↑	3.543	3.307	4.567	270 514	19 200	40 M 22x80	17	564.17	M 27	26.625
440 x 545	17.323	+0	21.457	-0	4.016	3.780	5.118	329 102	18 500	40 M 24X90	19	723.30	M 30	27.750
460 x 565	18.110	↓	22.244	+0.006	4.016	3.780	5.118	339 951	17 800	40 M 24X90	19	723.30	M 30	28.625
480 x 585	18.898	↓	23.031	↓	4.016	3.780	5.118	372 450	17 800	42 M 24X90	19	723.30	M 30	29.625
500 x 605	19.685	↓	23.819	↓	4.016	3.780	5.118	405 048	17 800	44 M 24X90	19	723.30	M 30	30.625

\*Stainless steel available upon request.

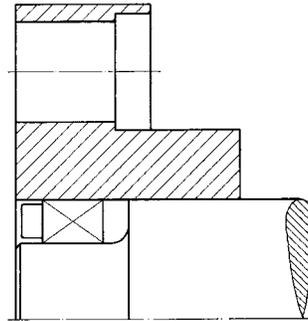
For larger sizes or additional information, request catalog S76A.

### Ordering Example

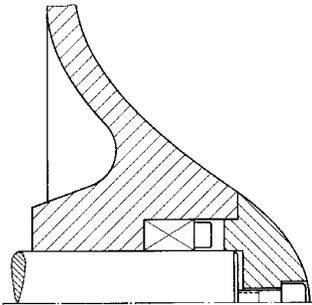
	Size	RfN	Series
Metric:	100 x 145	RfN	7012
Inch:	3-15/16	RfN	7012-IN



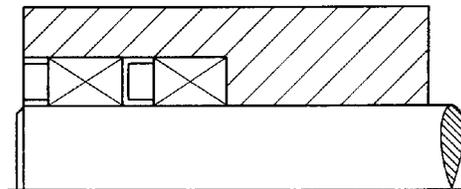
**Fig. 10: Locking Assembly™**  
Typical Ringfeder® Locking Assembly™ connection.



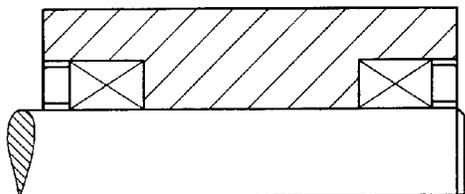
**Fig. 11: Coupling**  
Coupling half-mounted with a RfN 7012 Locking Assembly™. Here, the shaft is stepped to permit the largest possible hub cross-section.



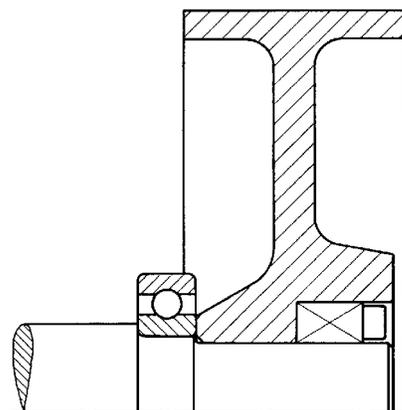
**Fig. 12: Impeller**  
Impeller mounted with a RfN 7012 Locking Assembly™. Here, the locking device is protected from moisture with a bolt-on cap.



**Fig. 13**  
Hub mounted using two RfN 7012 Locking Assemblies™ to transmit twice the torque.



**Fig. 14**  
Hub fastened with two RfN 7012 Locking Assemblies™ located at opposite ends of the hub. In this arrangement twice the torque is transmitted provided the hub length is less than four times the width of the Locking Assembly™. Bores must be concentric to each other.



**Fig. 15: Flat-Belt Pulley**  
Flat-belt pulley mounted with a RfN 7012 Locking Assembly™.

## INSTALLATION

- Verify that all contact surfaces, including the screw threads and screw head bearing surfaces, are clean and lightly oiled.  
*Note: Do NOT use Molybdenum Disulfide, "Molykote" or any other similar lubricants.*
- Slide the Locking Assembly™ onto the shaft and into the hub bore, aligning them as required.
- Tighten the locking screws gradually in the sequence illustrated in Fig. 16: Tightening Sequence as follows:
  - Hand-tighten 3 or 4 equally spaced locking screws until they make contact. Align and adjust the connection.
  - Hand-tighten and take up all remaining locking screws.
  - Use a torque wrench to tighten the screws further to approximately one-half the specified torque ( $M_A$ ).
  - Using the torque wrench tighten the screws to full tightening torque ( $M_A$ ).
  - Verify that the screws are completely tight by applying the specified tightening torque ( $M_A$ ).

## NOTES

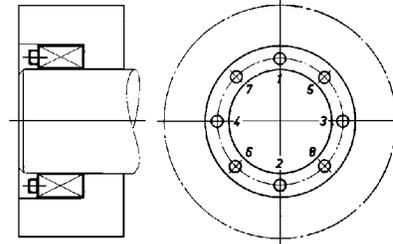
- Even tightening is best accomplished by turning each screw in increments of approximately 90°.
- For the final pass it is recommended to set the torque wrench by approximately 5% over the specified tightening torque ( $M_A$ ) to compensate for any possible settling.

## INSTALLATION TOOLS

- Standard torque wrench with either 1/4", 3/8", 1/2" or 3/4" square drive and suitable torque range; see Table 3: Locking Assembly™ Tightening Data for specified tightening torques ( $M_A$ ).
- Metric hexagonal-bit socket (Fig. 17: Square Drives) for torque wrench with suitable dimension across flats (s); see Table 3: Locking Assembly™ Tightening Data.
- Metric hexagonal key with across flats dimension (s).

### NOTE: DO NOT USE IMPACT WRENCH!

Since the torque is transmitted by contact pressure and friction between the frictional surfaces, the condition of the contact surfaces and the proper tightening of the locking screws are important.



**Fig. 16: Tightening Sequence**  
Tightening sequence for locking screws.

## REMOVAL

Ringfeder® Locking Assemblies™ are not self-locking. The individual rings are tapered so that the inner and outer rings spring apart after the last screw has been loosened.

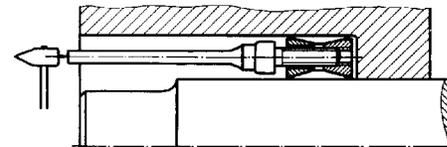
- Loosen the locking screws in several steps following a diametrically opposite sequence. Do not remove the screws completely.
- Remove the hub and Locking Assembly™ from the shaft.

## REMOVAL TOOL

- Three pull-out bolts or threaded rods with metric thread ( $d_D$ ) long enough for the specific application; see Table 3: Locking Assembly™ Tightening Data.

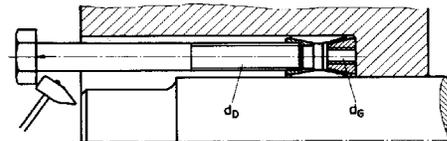


**Fig. 17: Square Drives**  
1/4", 3/8", 1/2" or 3/4" square drive



**Fig. 18: Rear Thrust Ring Jams**

If the rear thrust ring jams, tap lightly against the screw heads to make it snap back.



**Fig. 19: Front Thrust Ring Jams**

If the front thrust ring jams, remove the three zinc-plated screws to expose the pull-out threads ( $d_D$ ) of the front thrust ring. Screw in suitable bolts or threaded rods and lightly tap in an outward direction to release the front thrust ring. The pull-out threads have only 3 to 5 effective threads; they are unsuitable for strong pulling forces and should be used only to remove the Locking Assembly™.

**Table 3: Locking Assembly™ Tightening Data**

Locking Assemblies™		Tightening Torque Screw $M_A$		Screw Size ( $d_G$ ) Metric	Hex Key Size (s)	Square Drive Size	Pull-Out Thread ( $d_D$ ) Metric
RfN 7012 Metric Series	RfN 7012-IN Inch Series	(lb-ft)	(Nm)				
20 x 47 to 40 x 65	1 to 1-1/2	10.13	14	M 6	5	1/4"	M 8
42 x 75 to 65 x 95	1-5/8 to 2-9/16	25.32	35	M 8	6	1/4"	M 10
70 x 110 to 95 x 135	2-3/4 to 3-3/4	50.63	70	M 10	8	3/8"	M 12
100 x 145 to 160 x 210	3-15/16 to 6	90.41	125	M 12	10	3/8"	M 14
170 x 225 to 200 x 260	6-1/2 to 7-7/8	137.43	190	M 14	12	1/2"	M 16
220 x 285 to 260 x 325		213.37	295	M 16	14	1/2"	M 20
280 x 355 to 300 x 375		292.94	405	M 18	14	1/2"	M 22
320 x 405 to 340 x 425		419.51	580	M 20	17	3/4"	M 24
360 x 455 to 420 x 515		564.17	780	M 22	17	3/4"	M 27
440 x 545 to 1000 x 1110		723.30	1000	M 24	19	3/4"	M 30



# Ringfeder® Locking Assemblies™

RfN 7013 & RfN 7013-IN

## SELF-CENTERING SINGLE-TAPER DESIGN

Ringfeder® RfN 7013 Locking Assemblies™ are a single-taper design with a self-locking taper. The assemblies provide good self-centering action and concentricity, as well as increased torque capacity. Integral push-off screws for disassembly are provided. The assemblies are suitable for hubs with straight-thru bores and narrow hubs. A precentering hub section is not required.

These assemblies are available in two types:

- Straight-thru type: RfN 7013.0
- Flange type: RfN 7013.1

Flange type units fix the hub positively against their extended flange to prevent axial movement during tightening.

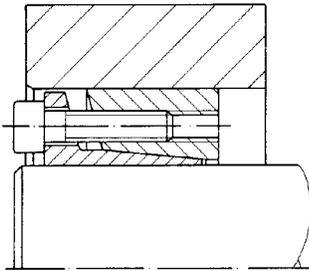


RfN 7013.0

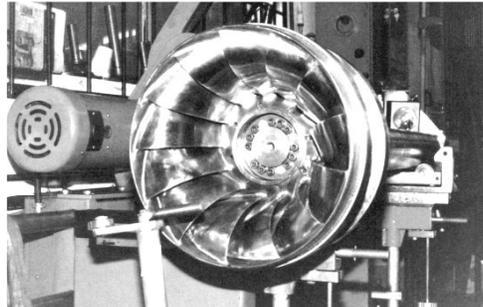


RfN 7013.1

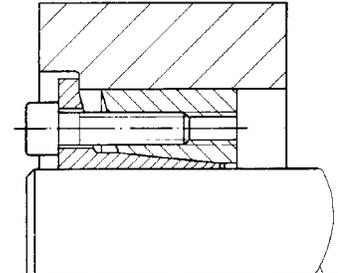
## Applications and Design Examples



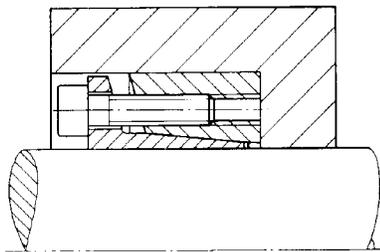
**Fig. 20**  
Hub mounted with a RfN 7013.0 Locking Assembly™ in a straight-thru bore.



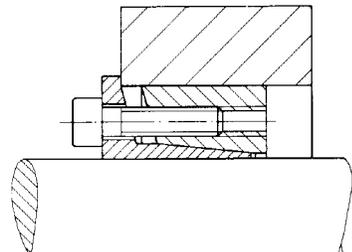
**Fig. 21: Turbine Runner**  
Turbine runner mounted with a Locking Assembly™.



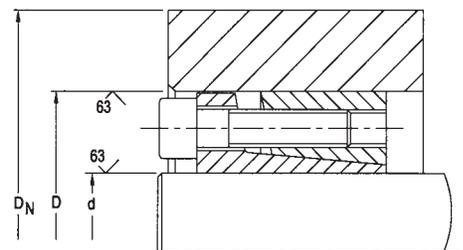
**Fig. 22**  
Hub mounted with a RfN 7013.1 Locking Assembly™ with countersunk flange.



**Fig. 23**  
Hub mounted with a RfN 7013.0 Locking Assembly™ in counterbore.



**Fig. 24**  
Hub mounted with a RfN 7013.1 Locking Assembly™ flange outside the hub bore.



**Fig. 25**  
Typical layout for a Locking Assembly™ installation.

- Determine the required shaft diameter ( $d$ ) or maximum torque ( $M_t$ ) to be transmitted:

$$\text{Torque } M_t = \frac{5252 \times \text{HP}}{\text{RPM}} \text{ (lb-ft)}$$

If combined torsional and axial loads are to be transmitted, calculate the resulting torque as follows:

$$M_{t \text{ res}} = \sqrt{M_t^2 + \left(\frac{P_{ax} \times d}{24}\right)^2} \leq M_{t \text{ cat}}$$

- $M_{t \text{ res}}$  = resultant torque to be transmitted
- $M_t$  = actual or maximum torque to be transmitted (lb-ft)
- $P_{ax}$  = axial load/thrust to be transmitted (lbs)
- $d$  = shaft diameter (inches)
- $M_{t \text{ cat}}$  = maximum transmissible torque (lb-ft) of Locking Assembly™ as specified

*Note: For hollow shaft applications, please consult Ringfeder Corporation.*

- Select a Locking Assembly™ for the shaft diameter ( $d$ ) from the specification tables and verify that the corresponding maximum transmissible torque ( $M_t$ ) meets the torque requirement.

If torque is the primary requirement, select the necessary torque ( $M_t$ ) from the same specification tables and determine the corresponding shaft diameter ( $d$ ).

*Note: Required peak torque should never exceed specified transmissible torque ( $M_t$ ).*

- Determine the recommended minimum hub outside diameter ( $D_N$ ) for the Locking Assembly™ selected from the specification tables or calculate the hub outside diameter ( $D_N$ ) as follows:

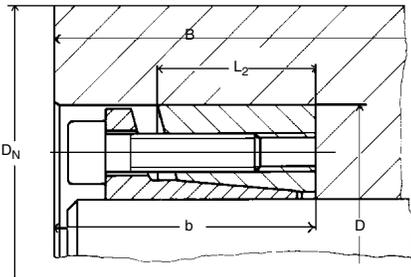
$$D_N \geq D \times \sqrt{\frac{YP + C_3 \times p'}{YP - C_3 \times p'}}$$

- YP = yield point of hub material (lbs/sq.in.)
- $p'$  = contact pressure (lbs/sq.in.) between Locking Assembly™ and hub (see Tables 4 or 5).
- $C_3$  = form factor depending on hub design (see Fig. 26, Fig. 27, or Fig. 28).

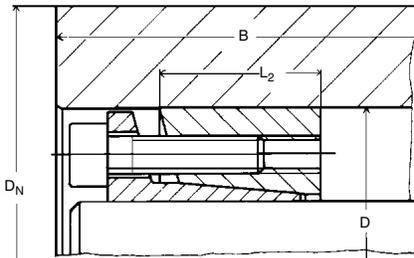
- Determine the applicable machining tolerances for the shaft and hub bores in Table 4 or 5. The required surface finish for shaft and hub bores is RMS 63 or better, but surface finishes should not be RMS 8 or less.

### Ordering Example

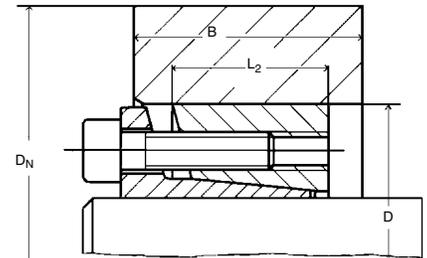
	Size	RfN	Series
Metric:	55 x 85	RfN	7013.0
Inch:	2-1/4	RfN	7013.1-IN



**Fig. 26**  
 $C_3 = 0.6$   
 Hub pre-centered on shaft  
 $B$  (hub width)  $\geq 2 \times L_2$ ,  $b \geq L_{tot}$



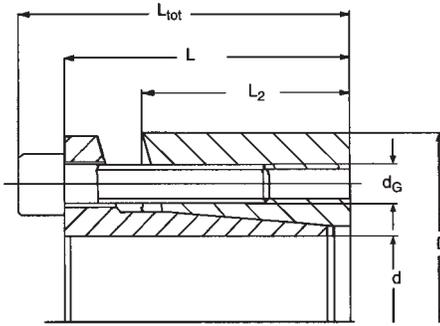
**Fig. 27**  
 $C_3 = 0.8$   
 Straight-thru bore  
 $B$  (hub width)  $\geq 2 \times L_2$



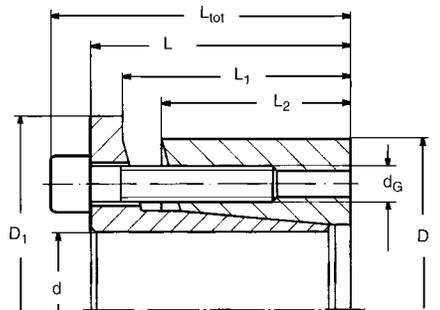
**Fig. 28**  
 $C_3 = 1$   
 (hub width)  
 $L_2 \leq B < 2 \times L_2$

### Ordering Example

	Size	RfN	Series
Metric:	60 x 90	RfN	7013.1
Inch:	2-7/8	RfN	7013.1-IN



**Fig. 29**  
Ringfeder® RfN 7013.0  
Locking Assembly™  
(hub moves freely axially  
during tightening).



**Fig. 30**  
Ringfeder® RfN  
7013.1 Locking  
Assembly™ (hub  
axially fixed during  
tightening).

- d = nominal Locking Assembly™ I.D.  
= shaft O.D.
- T<sub>1</sub> = machining tolerances for shaft (d)
- D = nominal Locking Assembly™ O.D.  
= hub counter bore I.D.
- T<sub>2</sub> = machining tolerances for counter bore (D)
- L<sub>tot</sub>, L, = width dimensions, relaxed condition
- L<sub>1</sub>, L<sub>2</sub>
- M<sub>t</sub> = maximum transmissible torque
- p = contact pressure between Locking Assembly™ and shaft
- p' = contact pressure between Locking Assembly™ and hub bore
- d<sub>G</sub> = metric socket head cap screw size
- s = metric hex key size (across flats)
- M<sub>A</sub> = required tightening torque per locking screw (tighten with torque wrench)
- D<sub>N</sub> = minimum hub O.D. for single-unit installation based on Y.P. of 36,000 psi hub material (for other hub materials calculate hub O.D. per step 3 of the Selection Guide)

**Notes** P<sub>ax</sub> = axial load (thrust capacity) =

$$\frac{M_t \times 24 \text{ lbs}}{d} \text{ (for } M_t \text{ in lb-ft)}$$

M<sub>t</sub>, P<sub>ax</sub>, p, and p' are based on a lightly oiled installation (coefficient of friction μ = 0.12)

**Table 4: Inch Series Locking Assemblies™ RfN 7013.0 & 7013.1-IN**  
Material: Medium Carbon Steel\*

RfN 7013 Size inches	Locking Assembly™ dimensions									max. M <sub>t</sub> lb-ft	p psi	p'	Locking screws DIN 912 – 12.9				D <sub>N</sub> inches	
	d	T <sub>1</sub>	D	T <sub>2</sub> inches	L <sub>tot</sub>	L	L <sub>1</sub>	L <sub>2</sub>	D <sub>1</sub>				Qty <sup>1) 2)</sup>	Size d <sub>G</sub>	s mm	M <sub>A</sub> lb-ft		
1	1.000	+0	1.969	↑	1.456	1.220	1.012	.854	2.205	323	40 170	15 070	5	7	M 6x20	5	12.5	2.875
1-3/16	1.1875	-.0013	2.165	↑	1.456	1.220	1.012	.854	2.441	385	33 800	13 650	5	7	M 6x20	5	12.5	3.000
1-1/4	1.250	↑	2.362	↑	1.456	1.220	1.012	.854	2.677	531	38 560	15 070	6	9	M 6x20	5	12.5	3.375
1-3/8	1.375	↑	2.362	↑	1.456	1.220	1.012	.854	2.677	585	35 055	15 070	6	9	M 6x20	5	12.5	3.375
1-7/16	1.4375	↑	2.559	↑	1.456	1.220	1.012	.854	2.874	620	33 495	13 935	6	10	M 6x20	5	12.5	3.625
1-1/2	1.500	+0	2.559	↑	1.456	1.220	1.012	.854	2.874	647	32 100	13 935	6	10	M 6x20	5	12.5	3.625
1-5/8	1.625	-.0016	2.953	↓	1.811	1.496	1.193	.996	3.267	1 234	43 870	19 055	6	9	M 8x25	6	30	4.750
1-3/4	1.750	↓	2.953	↓	1.811	1.496	1.193	.996	3.267	1 329	40 740	19 055	6	9	M 8x25	6	30	4.750
1-7/8	1.875	↓	3.150	↑	1.811	1.496	1.193	.996	3.464	1 426	38 070	17 915	6	9	M 8x25	6	30	4.875
1-15/16	1.9375	↓	3.150	↑	1.811	1.496	1.193	.996	3.464	1 473	36 840	17 915	6	9	M 8x25	6	30	4.875
2	2.000	↑	3.150	↑	1.811	1.496	1.193	.996	3.464	1 521	35 690	17 915	6	9	M 8x25	6	30	4.875
2-1/8	2.125	↑	3.346	↑	1.811	1.496	1.193	.996	3.740	1 803	39 125	19 625	7	10	M 8x25	6	30	5.500
2-3/16	2.1875	↑	3.346	↑	1.811	1.496	1.193	.996	3.740	1 856	38 005	19 625	7	10	M 8x25	6	30	5.500
2-1/4	2.250	↑	3.543	↑	1.811	1.496	1.193	.996	3.937	1 908	36 875	18 485	7	10	M 8x25	6	30	5.500
2-3/8	2.375	↑	3.543	↑	1.811	1.496	1.193	.996	3.937	2 014	34 935	18 485	7	10	M 8x25	6	30	5.500
2-7/16	2.4375	+0	3.740	↑	1.811	1.496	1.193	.996	4.134	2 466	38 965	20 050	8	12	M 8x25	6	30	6.125
2-1/2	2.500	-.0018	3.740	↑	1.811	1.496	1.193	.996	4.134	2 530	37 990	20 050	8	12	M 8x25	6	30	6.125
2-9/16	2.5625	↓	3.740	↑	1.811	1.496	1.193	.996	4.134	2 593	37 065	20 050	8	12	M 8x25	6	30	6.125
2-3/4	2.750	↓	4.331	↓	2.362	1.968	1.590	1.315	4.724	3 680	34 770	18 200	7	10	M 10x35	8	60	6.750
2-7/8	2.875	↓	4.528	↓	2.362	1.968	1.590	1.315	4.921	3 845	33 300	16 920	7	10	M 10x35	8	60	6.875
2-15/16	2.9375	↓	4.528	↓	2.362	1.968	1.590	1.315	4.921	3 929	32 590	16 920	7	10	M 10x35	8	60	6.875
3	3.000	↓	4.528	↓	2.362	1.968	1.590	1.315	4.921	4 012	31 910	16 920	7	10	M 10x35	8	60	6.875
3-3/8	3.375	↑	4.921	↑	2.362	1.968	1.590	1.315	5.315	5 434	32 430	18 345	8	12	M 10x35	8	60	7.625
3-7/16	3.4375	↑	5.118	↑	2.362	1.968	1.590	1.315	5.512	5 543	31 810	17 630	8	12	M 10x35	8	60	7.875
3-1/2	3.500	+0	5.118	↑	2.362	1.968	1.590	1.315	5.512	5 644	31 240	17 630	8	12	M 10x35	8	60	7.875
3-3/4	3.750	-.0022	5.315	↑	2.362	1.968	1.590	1.315	5.709	7 180	36 450	21 190	10	15	M 10x35	8	60	9.000
3-15/16	3.9375	↓	5.709	↓	2.677	2.283	1.882	1.606	6.102	7 957	27 300	16 210	10	15	M 10x35	8	60	8.500
4	4.000	↓	5.709	↓	2.677	2.283	1.882	1.606	6.102	8 083	26 870	16 210	10	15	M 10x35	8	60	8.500

1) Number of screws in type RfN 7013.0

2) The number of screws in type RfN 7013.1 is higher to compensate for increased friction when the hub is fixed

\* Stainless steel upon request

**Table 5: Metric Series Locking Assemblies™ RfN 7013.0 & 7013.1**

Material: Medium Carbon Steel\*

RfN 7013 Size mm	Locking Assembly™ dimensions									max. M <sub>t</sub> lb-ft	p psi	p'	Locking screws DIN 912 – 12.9				D <sub>N</sub> inches	
	d	T <sub>1</sub>	D	T <sub>2</sub> inches	L <sub>tot</sub>	L	L <sub>1</sub>	L <sub>2</sub>	D <sub>1</sub>				Qty <sup>1) 2)</sup>	Size d <sub>G</sub>	s mm	M <sub>A</sub> lb-ft		
20x 47	.787	↑	1.850	- 0	1.456	1.220	1.012	.854	2.086	217	40 810	12 800	4	6	M 6x20	5	12.5	2.625
22x 47	.866	↑	1.850	+0.0016	1.456	1.220	1.012	.854	2.086	238	36 975	12 800	4	6	M 6x20	5	12.5	2.625
24x 50	.945	+0	1.969	↑	1.456	1.220	1.012	.854	2.205	303	42 520	15 070	5	7	M 6x20	5	12.5	2.875
25x 50	.984	-0.0013	1.969	↑	1.456	1.220	1.012	.854	2.205	318	40 810	15 070	5	7	M 6x20	5	12.5	2.875
28x 55	1.102	↑	2.165	↑	1.456	1.220	1.012	.854	2.441	354	36 405	13 650	5	7	M 6x20	5	12.5	3.000
30x 55	1.181	↓	2.165	↑	1.456	1.220	1.012	.854	2.441	383	33 985	13 650	5	7	M 6x20	5	12.5	3.000
32x 60	1.260	↑	2.362	↑	1.456	1.220	1.012	.854	2.667	535	38 250	15 070	6	9	M 6x20	5	12.5	3.375
35x 60	1.378	↑	2.362	↑	1.456	1.220	1.012	.854	2.667	585	34 980	15 070	6	9	M 6x20	5	12.5	3.375
38x 65	1.496	↑	2.559	- 0	1.456	1.220	1.012	.854	2.874	640	32 130	13 935	6	10	M 6x20	5	12.5	3.625
40x 65	1.575	+0	2.559	+0.0018	1.456	1.220	1.012	.854	2.874	680	30 575	13 935	6	10	M 6x20	5	12.5	3.625
42x 75	1.654	-0.0016	2.953	↑	1.811	1.496	1.193	.996	3.267	1 250	43 085	19 055	6	9	M 8x25	6	30	4.750
45x 75	1.772	↓	2.953	↑	1.811	1.496	1.193	.996	3.267	1 345	40 245	19 055	6	9	M 8x25	6	30	4.750
48x 80	1.890	↓	3.150	↓	1.811	1.496	1.193	.996	3.464	1 430	37 825	17 915	6	9	M 8x25	6	30	4.875
50x 80	1.969	↓	3.150	↓	1.811	1.496	1.193	.996	3.464	1 497	36 260	17 915	6	9	M 8x25	6	30	4.875
55x 85	2.165	↑	3.346	↑	1.811	1.496	1.193	.996	3.740	1 837	38 395	19 625	7	10	M 8x25	6	30	5.500
60x 90	2.362	↑	3.543	↑	1.811	1.496	1.193	.996	3.937	2 003	35 125	18 485	7	10	M 8x25	6	30	5.500
65x 95	2.559	+0	3.740	- 0	1.811	1.496	1.193	.996	4.134	2 589	37 115	20 050	8	12	M 8x25	6	30	6.125
70x110	2.756	-0.0018	4.331	+0.0022	2.362	1.968	1.590	1.315	4.724	3 688	34 700	18 200	7	10	M10x35	8	60	6.750
75x115	2.953	↓	4.528	↑	2.362	1.968	1.590	1.315	4.921	3 949	32 425	16 920	7	10	M10x35	8	60	6.875
80x120	3.150	↓	4.724	↓	2.362	1.968	1.590	1.315	5.118	4 231	30 430	15 925	7	10	M10x35	8	60	6.937
85x125	3.346	↑	4.921	↑	2.362	1.968	1.590	1.315	5.315	5 388	32 710	18 345	8	12	M10x35	8	60	7.625
90x130	3.543	↑	5.118	↑	2.362	1.968	1.590	1.315	5.512	5 714	30 860	17 630	8	12	M10x35	8	60	7.875
95x135	3.740	+0	5.315	- 0	2.362	1.968	1.590	1.315	5.709	7 160	36 545	21 190	10	15	M10x35	8	60	9.000
100x145	3.937	-0.0022	5.709	+0.0025	2.677	2.283	1.882	1.606	6.102	7 956	27 300	16 210	10	15	M10x35	8	60	8.500
110x155	4.331	↓	6.102	↑	2.677	2.283	1.882	1.606	6.496	8 751	24 885	15 215	10	15	M10x35	8	60	8.750
120x165	4.724	↓	6.496	↓	2.677	2.283	1.882	1.606	6.890	11 355	27 300	17 065	12	18	M10x35	8	60	9.875
130x180	5.118	↑	7.087	↑	3.031	2.560	2.063	1.787	7.480	14 972	26 735	17 065	10	15	M12x40	10	105	10.625
140x190	5.512	+0	7.480	- 0	3.031	2.560	2.063	1.787	7.874	16 274	24 885	16 210	10	15	M12x40	10	105	11.250
150x200	5.906	-0.0025	7.874	+0.0028	3.031	2.560	2.063	1.787	8.267	20 614	27 875	18 485	12	18	M12x40	10	105	12.375

1) Number of screws in type RfN 7013.0

2) The number of screws in type RfN 7013.1 is higher to compensate for increased friction when the hub is fixed

\* Stainless steel upon request

## Installation and Removal Instructions

Since the torque is transmitted by contact pressure and friction between the frictional surfaces, the condition of the contact surfaces and the proper tightening of the locking screws are important.

### INSTALLATION

- Verify that all contact surfaces, including the screw threads and screw head bearing surfaces, are clean and lightly oiled.

*Note: Do NOT use Molybdenum Disulfide, "Molykote" or any other similar lubricants.*

- Slide the Locking Assembly™ onto the shaft and into the hub bore, aligning them as required.
- Tighten the locking screws gradually in a diametrically opposite sequence as follows:
  - Hand-tighten 3 or 4 equally spaced locking screws until they make contact. Align and adjust the connection.
  - Hand-tighten and take up all remaining locking screws.
  - Use a torque wrench to tighten the screws further to approximately one-half the specified torque (M<sub>A</sub>).
  - Using the torque wrench tighten the screws to full tightening torque (M<sub>A</sub>).
  - Verify that the screws are completely tight by applying the specified tightening torque (M<sub>A</sub>).

### REMOVAL

- Loosen all screws several turns.
- Remove the screw adjacent to each threaded jacking hole and screw it into its corresponding jacking hole to press off the outer ring. This releases the connection.
- Remove the hub and the Locking Assembly™ from the shaft. Leave the screws in the jacking holes until you have completely removed the Locking Assembly™ from the hub.  
Disassemble and clean dirty undamaged Locking Assemblies™ before re-use.

### TOOLS REQUIRED FOR ASSEMBLY AND REMOVAL

- Standard torque wrench with either 1/4" or 3/8" square drive and suitable torque range; see Table for specified tightening torques (M<sub>A</sub>).
- Metric hexagonal bit socket (see Fig. 31: Square Drives) for torque wrench with suitable across flats dim. (s); see Table 3.

**NOTE:** DO NOT USE IMPACT WRENCH!

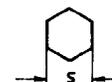


Fig. 31: Square Drives 1/4" or 3/8" square drive

# 4

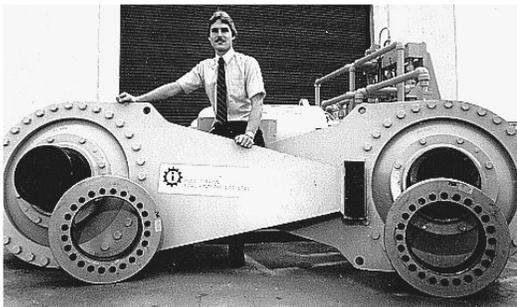
## Ringfeder® Shrink Discs®

RfN 4071, RfN 4091 & RfN 4051

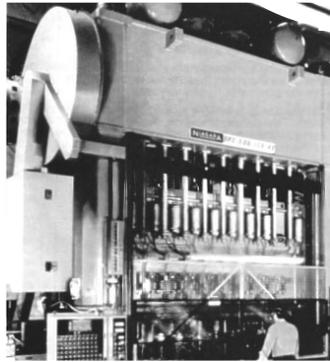
Shrink Discs® are used to transmit high torques, particularly when external clamping is advantageous and a high degree of concentricity is required. Ringfeder® Shrink Discs® are self-contained and ready for installation over a hub projection.



### Applications Examples



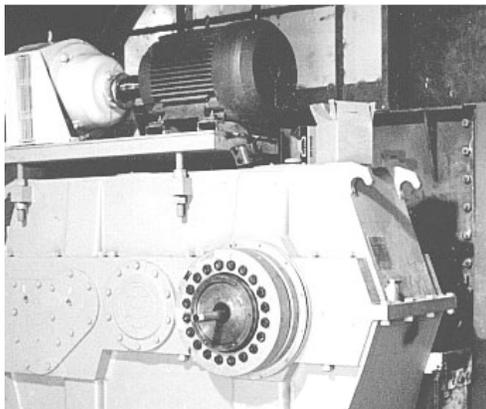
**Fig. 32: Apron Feeder Drive**  
Apron feeder drive; hydraulic power unit, Ridley Island Coal Terminal.



**Fig. 33: Gear**  
Gear mounted with a Shrink Disc® on a straight side press.



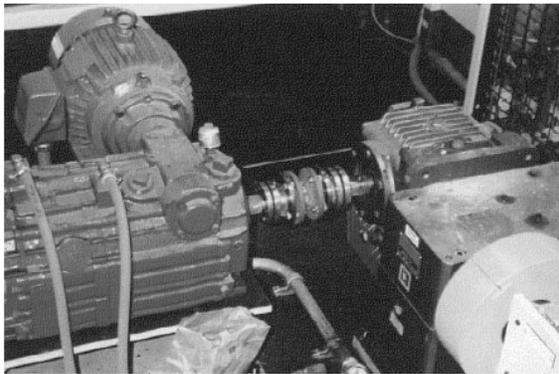
**Fig. 34: Clutch**  
Clutch of a 2,500 ton press shaft mounted with a Shrink Disc®.



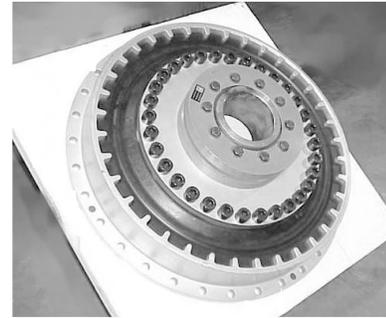
**Fig. 35: Speed Reducer**  
Shaft-mounted speed reducer fastened with a Shrink Disc®.



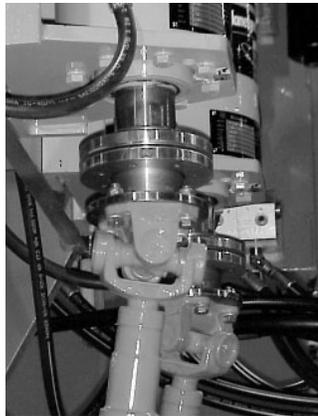
**Fig. 36: Shrink Disc®**  
RING-flex® torsionally rigid, backlash-free couplings use Ringfeder® Shrink Discs® to give a truly backlash-free shaft to shaft coupling.



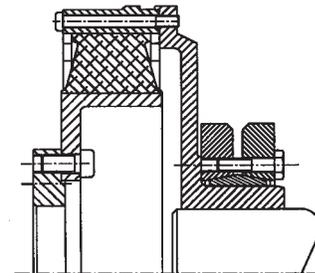
**Fig. 37:**  
RING-flex® coupling in automotive plant main conveyor drive.



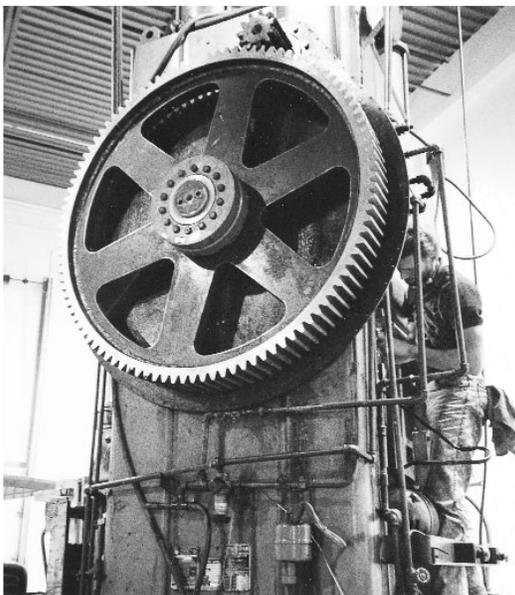
**Fig. 38:**  
Shrink Disc® on engine flywheel coupling for diesel driven compressor.



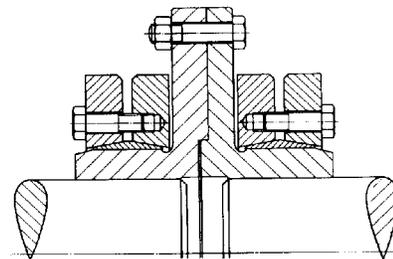
**Fig. 39:**  
Shrink Disc® on U-joint drive in sawmill equipment.



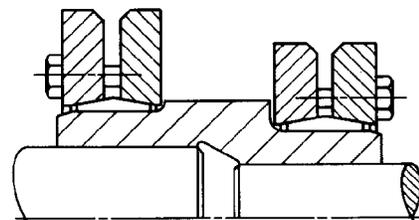
**Fig. 40:**  
Diesel engine flywheel coupling.



**Fig. 41:**  
Shrink Disc® on bull gear of punch press.



**Fig. 42: Rigid Flange Coupling**



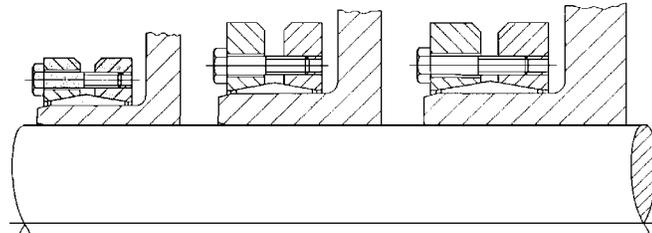
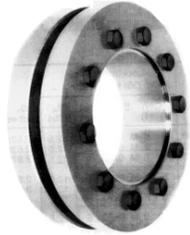
**Fig. 43: Stepped Sleeve Coupling**  
Rigid Shrink Disc® stepped sleeve coupling.

## Relative Comparison of Shrink Disc® Series

The original Shrink Discs® are available in three series:

Standard Series	RfN 4071
Heavy Duty Series	RfN 4091
Light Duty Series	RfN 4051

**SHRINK  
DISCS®**

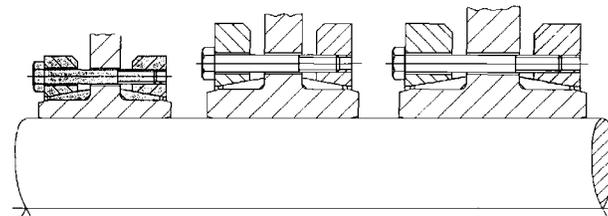


**RfN 4051**  
LIGHT DUTY  
SERIES

**RfN 4071**  
STANDARD  
DUTY SERIES

**RfN 4091**  
HEAVY DUTY  
SERIES

**SPLIT  
SHRINK  
DISCS®**

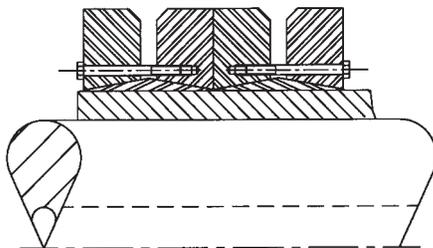


**RfN 4051-SR**  
LIGHT DUTY  
SERIES

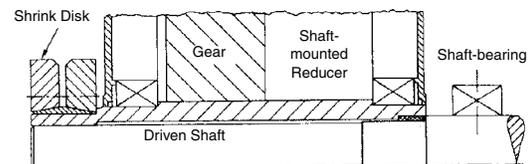
**RfN 4071-SR**  
STANDARD  
DUTY SERIES

**RfN 4091-SR**  
HEAVY DUTY  
SERIES

## More Design Examples

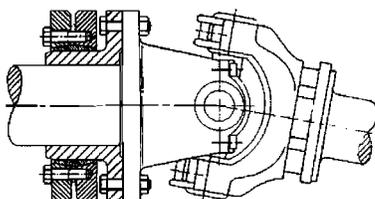


**Fig. 44:** Two Shrink Discs® in line offer 2X the torque capacity of one.

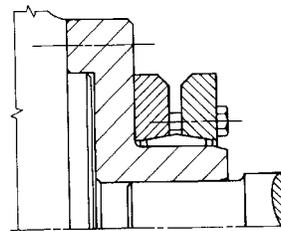


**Fig. 45: Speed Reducer**

Shaft-mounted speed reducer. Illustrated stepped shaft configuration provides 2-point contact eliminating skewing during installation (installed position shown).



**Fig. 46: Universal Joint Connection**



**Fig. 47: Adapter Flanges**  
Type HSDA Shrink Disc®  
adapter flanges (available for  
Hågglunds drives).

The *Maximum Transmissible Torque* is a function of the shaft diameter, the coefficient of friction ( $\mu$ ) and the clearance between the shaft and hub. Torque is calculated using the equation:

$$M_t = \frac{P \times \pi \times d_w^2 \times l \times \mu}{24}$$

- P = contact pressure between shaft and hub (psi)
- $d_w$  = shaft diameter (inches)
- l = inner ring length (inches)

*Coefficient of friction* ( $\mu$ ) can vary widely depending on material and surface finish. A well-accepted number for interference fits that are lightly oiled is  $\mu=0.12$ . This fig. is used to determine torque capacity listed in this catalog. If shaft and hub are assembled dry,  $\mu=0.15$  can be assumed. Tests have shown that grease-free connections can attain coefficients greater than 0.2. The transmissible torque is then increased proportionately.

Hub stress calculation, which determine the material requirements for the hub, are based on multi-directional stresses. The following equation uses the "maximum distortion energy theory" to calculate the maximum combined stress in the hub.

$$\sigma_{V_H} = \sqrt{1/2 \{ (\sigma_{X_H} - \sigma_{Y_H})^2 + (\sigma_{Y_H} - \sigma_{Z_H})^2 + (\sigma_{Z_H} - \sigma_{X_H})^2 \} + 3\tau_H^2}$$

where:

- $\sigma_{V_H}$  = combined stress (psi)
- $\sigma_{X_H}$  = tangential stress (psi)
- $\sigma_{Y_H}$  = radial stress (psi)
- $\sigma_{Z_H}$  = axial and bending stress (psi)
- $\tau_H$  = torsional shear stress (psi)

Individual stress components can be determined by using the Lamé thick wall cylinder equations. (See Fig. 48).

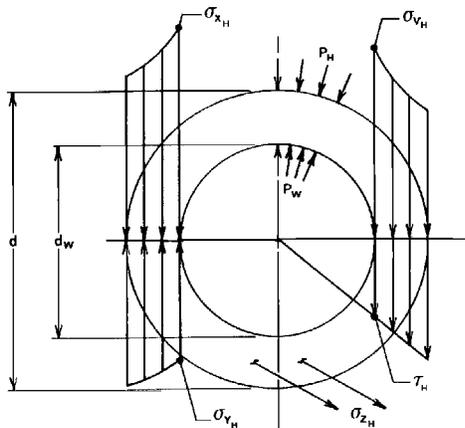


Fig. 48

*Fit clearances* can also affect torque capacity. Catalog values are calculated using maximum fit clearance. See subsequent data tables for suggested tolerance allowances. These fits will allow easy assembly and disassembly.

If larger clearances are required, torque will be reduced proportionately. Also, hub stresses will increase and could exceed the yield strength of the material, causing plastic deformation. Please contact us if larger fit clearances are required.

Allowable hub O.D. tolerances and maximum radius allowed adjacent to the Shrink Disc® are given in subsequent data tables. Materials with a minimum yield point of 50,000 psi are recommended. Because the hub is in compression, grey cast irons are suitable. Other materials can be used if combined stresses are kept below the yield point of the material. Contact our engineering department for a complete stress analysis.

*Hollow shafts* do not act the same as solid shafts under compressive radial loads. Depending on the wall thickness there will be varying amounts of elastic deformation and consequently a reduction in torque capacity. Our engineering department can provide complete information based on your requirements.

If combined torsional and axial loads are to be transmitted, calculate the torque as follows:

$$M_{t \text{ res}} = \sqrt{M_t^2 + \left( \frac{P_{ax} \times d}{24} \right)^2} \leq M_{t \text{ cat}}$$

- $M_{t \text{ res}}$  = resultant torque to be transmitted (lb-ft)
- $M_t$  = actual or maximum torque to be transmitted (lb-ft)
- $P_{ax}$  = axial load-thrust to be transmitted (lbs)
- $d_w$  = shaft diameter (inches)
- $M_{t \text{ cat}}$  = max. transmissible torque (lb-ft) of Shrink Disc™ as specified in catalog

The required surface finish for both shaft and hub projection I.D. and O.D. is RMS 125 microinches or better.

### Shrink Discs®

- 1 Determine the shaft diameter ( $d_w$ ) to be used or the maximum torque ( $M_t$ ) to be transmitted.  
*Note: For hollow shaft applications, consult Ringfeder Corporation.*
- 2 Select a Shrink Disc® from the Table for required shaft dia. ( $d_w$ ) and verify that the corresponding maximum transmissible torque ( $M_t$ ) meets the torque requirement.

If torque is the primary requirement, select the necessary torque ( $M_t$ ) from the same specification table and determine the corresponding shaft diameter ( $d_w$ ).

- 3 Incorporate the specified dimensions of the selected Shrink Disc® and required hub into your design and drawing. Indicate the specified tightening torque ( $M_A$ ) for each locking screw on the drawing.
- 4 Establish machining tolerances ( $T_H$ ,  $T_W$ ) for shaft, hub bore and hub outer diameter from the specification tables.

### Ordering Example

	Size	RfN	Series
Example:	90	RfN	4071

## Shrink Discs® RfN 4071 Specifications

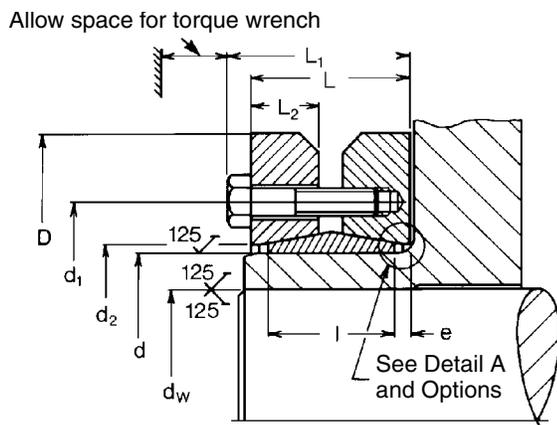
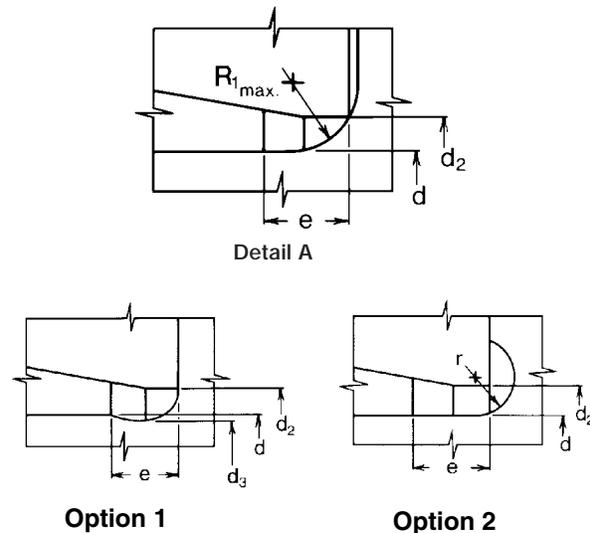


Fig. 49: Shrink Disc® Layout  
Shrink Disc® RfN 4071



$d$	= nominal Shrink Disc™ I.D. = hub projection O.D.
$T_H$	= specified tolerance for hub O.D. ( $d$ )
$d_W$	= shaft size range (min. - max.)
$T_W$	= total allowable diametrical clearance between shaft and hub bore ( $d_W$ )
$M_t$	= maximum transmissible torque
$D$	= Shrink Disc™ O.D.
$d_1$	= bolt circle dia.
$d_2$	= thrust ring I.D.

$L, L_1, L_2, e$	= width dimensions, relaxed condition
$s$	= head dimension across flats (mm)
$M_A$	= required tightening torque per locking screw
$d_3$	= $0.98 \times d$ (for option 1)
$r$	= customer selectable (for option 2)
$P_{ax}$	= $\frac{M_t \times 24}{d_w}$ lbs (for option 2)

- Notes**
- 1 Tapers and screws lubricated with Molykote Gn Paste or equivalent.
  - 2 For Series RfN 4071:  
Sizes 24 to 200 have a thru-drilled tapped hole.  
All larger sizes have a blind tapped hole.

**Table 6: Shrink Disc® Series RfN 4071**

*Material: Alloy Steel\**

RfN 4071 Size	Shaft/Hub dimensions					max. M <sub>t</sub> lb-ft	Shrink Disc® dimensions								Locking screws DIN 931 - 10.9				
	d	T <sub>H</sub>	d <sub>W</sub> inches	T <sub>W</sub>	R <sub>1max.</sub>		D	d <sub>1</sub>	d <sub>2</sub>	l inches	L	L <sub>1</sub>	L <sub>2</sub>	e	Wt. lbs	Qty	Size	s mm	M <sub>A</sub> lb-ft
24	.945	+0	.625 .827	↑	↑	77 184	1.97	1.417	1.024	.551	.768	.906	.315	.108	.4	6	M 5x 18	8	3
30	1.181	-.0013	.875 1.024	↑	↑	160 273	2.36	1.732	1.260	.630	.846	.984	.354	.108	.7	7	M 5x 18	8	3
36	1.417	↑	1.062 1.220	↑	↑	295 465	2.83	2.047	1.496	.709	.925	1.083	.394	.108	.9	5	M 6x 20	10	9
44	1.732	+0 -.0015	1.250 1.437	↑	↑	438 660	3.15	2.402	1.850	.787	1.004	1.161	.433	.108	1.3	7	M 6x 20	10	9
50	1.969	↓	1.496 1.654	↑	↓	693 1 018	3.54	2.756	2.087	.866	1.083	1.240	.472	.108	1.8	8	M 6x 25	10	9
55	2.165	↑	1.654 1.890	↑	↑	856 1 387	3.94	2.953	2.283	.906	1.201	1.358	.512	.148	2.4	8	M 6x 25	10	9
62	2.441	↓	1.890 2.047	↑	↓	1 365 1 770	4.33	3.386	2.598	.906	1.201	1.358	.512	.148	2.9	10	M 6x 25	10	9
68	2.677	+0 -.0018	1.969 2.362	↑	↑	1 475 2 323	4.53	3.386	2.835	.906	1.201	1.358	.512	.148	3.1	10	M 6x 25	10	9
75	2.953	↓	2.165 2.559	↑	↓	1 844 2 914	5.43	3.937	3.110	.984	1.280	1.496	.551	.148	3.7	7	M 8x 30	13	22
80	3.150	↓	2.362 2.756	↑	↓	2 360 3 393	5.71	3.937	3.307	.984	1.280	1.496	.551	.148	4.2	7	M 8x 30	13	22
90	3.543	↑	2.559 2.953	↑	↑	3 504 5 348	6.10	4.488	3.701	1.181	1.535	1.752	.669	.177	7.3	10	M 8x 35	13	22
100	3.937	+0 -.0021	2.756 3.150	↑	↑	5 089 6 638	6.69	4.882	4.094	1.339	1.732	1.949	.748	.197	10.4	12	M 8x 35	13	22
110	4.331	↓	2.953 3.346	↑	↓	5 311 7 966	7.28	5.354	4.488	1.535	1.969	2.244	.866	.217	13.0	9	M 10x 40	17	44
125	4.921	↑	3.346 3.740	↑	↑	8 114 11 064	8.46	6.299	5.276	1.654	2.126	2.402	.906	.236	18.3	12	M 10x 40	17	44
140	5.512	↓	3.740 4.134	↑	↓	11 138 14 826	9.06	6.890	5.748	1.811	2.382	2.697	1.024	.285	22.0	10	M 12x 45	19	74
155	6.102	+0 -.0025	4.134 4.528	↑	↑	16 227 20 653	10.43	7.559	6.496	1.969	2.539	2.854	1.102	.285	33.1	12	M 12x 50	19	74
165	6.496	↓	4.528 4.921	↑	↓	22 866 28 766	11.42	8.268	6.890	2.205	2.795	3.189	1.220	.295	48.5	8	M 16x 55	24	185
175	6.890	↓	4.921 5.315	↑	↓	26 554 33 192	11.81	8.661	7.283	2.205	2.795	3.198	1.220	.295	48.5	8	M 16x 55	24	185
185	7.283	↑	5.315 5.709	↑	↑	38 355 45 731	12.99	9.291	7.677	2.795	3.386	3.780	1.496	.295	81.6	10	M 16x 65	24	185
195	7.677	↓	5.512 6.102	↑	↓	47 944 60 114	13.78	9.685	8.268	2.795	3.386	3.780	1.496	.295	90.4	12	M 16x 65	24	185
200	7.874	+0 -.0028	5.906 6.299	↑	↑	54 582 63 434	13.78	9.685	8.268	2.795	3.386	3.780	1.496	.295	90.4	12	M 16x 65	24	185
220	8.661	↓	6.299 6.693	↑	↓	70 072 81 136	14.57	10.630	9.055	3.465	4.094	4.488	1.850	.315	119.0	15	M 16x 80	24	185
240	9.449	↓	6.693 7.480	↑	↓	88 512 115 066	15.94	11.614	9.764	3.622	4.291	4.803	1.929	.335	147.7	12	M 20x 80	30	362
260	10.236	↑	7.480 8.268	↑	↑	120 966 151 208	16.93	12.638	10.551	4.055	4.724	5.236	2.126	.335	180.8	14	M 20x 90	30	362
280	11.024	+0 -.0032	8.268 9.055	↑	↑	160 059 199 152	18.11	13.622	11.339	4.488	5.276	5.787	2.362	.394	224.9	16	M 20x100	30	362
300	11.811	↓	9.055 9.646	↑	↓	202 840 232 344	19.09	14.331	12.126	4.803	5.591	6.102	2.520	.394	260.1	18	M 20x100	30	362
320	12.598	↑	9.449 10.236	↑	↑	230 131 275 862	20.47	15.197	12.913	4.803	5.591	6.102	2.520	.394	288.8	20	M 20x100	30	362
340	13.386	↓	9.843 10.630	↑	↓	287 664 339 296	22.44	16.063	13.701	5.276	6.142	6.654	2.795	.433	410.1	24	M 20x110	30	362
350	13.780	↑	10.630 11.220	↑	↑	326 019 368 800	22.83	17.008	14.094	5.512	6.378	6.890	2.874	.433	429.9	24	M 20x110	30	362
360	14.173	+0 -.0035	11.024 11.614	↑	↑	341 509 385 027	23.23	17.008	14.488	5.512	6.378	6.890	2.874	.433	449.7	24	M 20x110	30	362
380	14.961	↓	11.417 12.205	↑	↓	418 219 485 341	25.39	18.031	15.236	5.669	6.614	7.205	2.992	.472	526.9	20	M 24x120	36	620
390	15.354	↑	11.811 12.598	↑	↑	460 262 529 597	25.98	18.425	15.630	5.669	6.614	7.205	2.992	.472	573.2	21	M 24x120	36	620
400	15.748	↓	12.402 12.992	↑	↓	494 192 548 774	26.77	18.898	16.024	5.669	6.614	7.205	2.992	.472	617.3	21	M 24x120	36	620
420	16.535	↑	12.992 13.780	↑	↑	575 328 663 840	27.17	19.843	16.811	6.457	7.402	7.992	3.386	.472	696.7	24	M 24x130	36	620
440	17.323	↓	13.386 14.173	↑	↓	594 506 676 379	29.53	20.748	17.598	6.969	7.953	8.543	3.583	.492	899.5	24	M 24x140	36	620
460	18.110	+0 -.0038	14.173 14.961	↑	↑	737 600 840 864	30.31	21.535	18.425	6.969	7.953	8.543	3.583	.492	925.9	28	M 24x140	36	620
480	18.898	↓	14.961 15.748	↑	↓	862 992 966 256	31.50	22.441	19.213	7.402	8.386	8.976	3.780	.492	1113.3	30	M 24x140	36	620
500	19.685	↓	15.748 16.535	↑	↓	967 731 1073 208	33.46	23.228	20.000	7.402	8.386	9.055	3.780	.492	1267.6	24	M 27x150	41	922

\* Stainless steel available upon request.

Additional information is available for Heavy Duty Series RfN 4091 and Light Duty Series RfN 4051.

# Light Duty Shrink Discs® RfN 4051 Specifications

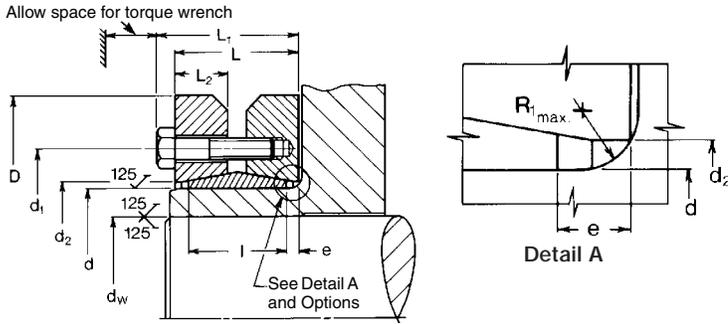
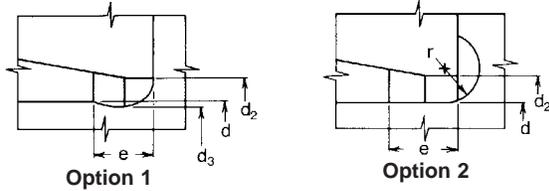


Fig. 50: Shrink Disc®



- d = nominal Shrink Disc® I.D.
- = hub projection O.D.
- $T_H$  = specified tolerance for hub O.D. (d)
- $d_W$  = shaft size range (min.- max.)
- $T_W$  = total allowable diametrical clearance between shaft and hub bore ( $d_W$ )
- $M_t$  = maximum transmissible torque
- D = Shrink Disc® O.D.
- $d_1$  = bolt circle dia.
- $d_2$  = thrust ring I.D.
- $L, L_1, L_2, e$  = width dimensions, relaxed condition
- $P_{ax}$  = axial load (thrust capacity)

$$= \frac{M_t \times 24}{d} \text{ lbs (for } M_t \text{ in lb-ft)}$$

- s = head dimension across flats (mm)
- $M_A$  = required tightening torque per locking screw
- $d_3$  = 0.98 x d (for Option 1)
- r = to be selected by customer (for Option 2)

**Notes**

1. Tapers and screws lubricated with Molykote Gn Paste or equivalent.
2. For Series RfN 4051:  
 Sizes 125 to 260 have a thru-drilled tapped hole.  
 All larger sizes have a blind tapped hole.

**Table 7: Light Duty Shrink Disc® RfN 4051**

Material: Alloy Steel\*

RfN 4051 Size	Shaft/Hub dimensions					max. $M_t$ lb-ft	Shrink Disc® dimensions								Locking screws DIN 931 - 10.9				
	d	$T_H$	$d_W$ inches	$T_W$	$R_{1max}$		D	d1	d2	L inches	$L_1$	$L_2$	e	Wt. lbs	Qty	Size	s mm	$M_A$ lb-ft	
125	4.921		3.740 4.134 4.331 4.921			7 782 10 179	7.28	6.220	5.079	1.535	2.008	2.283	.866	.236	13.2	8	M 10x 40	17	44
140	5.512		5.118 5.512	.0027	.225	10 916 15 121	8.66	6.890	5.669	1.535	2.008	2.283	.866	.236	17.6	9	M 10x 40	17	44
155	6.102	+0 -.0025	5.315 5.709			17 702 21 390	9.65	7.559	6.260	1.535	2.008	2.283	.866	.236	22.0	11	M 10x 40	17	44
165	6.496		5.709 6.102			23 603 28 398	10.24	8.268	6.654	1.811	2.441	2.756	1.024	.315	30.9	10	M 12x 50	19	74
175	6.890		6.102 6.496 6.890	.0031	.300	28 766 33 930	10.83	8.661	7.047	1.811	2.441	2.756	1.024	.315	35.3	11	M 12x 50	19	74
185	7.283		6.496 6.890			34 372 39 830	11.61	8.858	7.441	1.811	2.441	2.756	1.024	.315	44.1	12	M 12x 50	19	74
195	7.677		6.890 7.283			46 469 53 476	12.40	9.331	7.835	2.205	2.835	3.150	1.220	.315	59.5	15	M 12x 55	19	74
200	7.874	+0 -.0028	7.283 7.087 7.874			54 582 62 327	12.99	9.528	8.031	2.205	2.835	3.150	1.220	.315	66.1	16	M 12x 55	19	74
220	8.661		7.874 7.874 8.465	.0035	.340	61 073 77 448	13.58	10.433	8.819	2.598	3.307	3.701	1.417	.354	77.2	10	M 16x 65	24	185
240	9.449		8.465 8.661 9.252			83 349 99 207	14.57	11.417	9.606	2.598	3.307	3.701	1.417	.354	97.0	12	M 16x 65	24	185
260	10.236		9.252 9.843			109 902 127 605	15.55	12.205	10.433	2.835	3.622	4.016	1.575	.354	105.8	14	M 16x 70	24	185
280	11.024	+0 -.0032	9.843 10.630 11.417		.380	126 130 153 421	16.73	13.110	11.220	3.307	4.094	4.488	1.811	.394	132.3	16	M 16x 75	24	185
300	11.811		11.417 12.008			158 584 188 088	18.11	14.094	12.008	3.307	4.094	4.488	1.811	.394	165.3	18	M 16x 75	24	185
320	12.598		12.008 11.811 12.205	.0040	.420	191 776 225 706	19.49	14.882	12.795	3.307	4.173	4.567	1.890	.433	185.2	20	M 16x 75	24	185
340	13.386		12.205 11.811 12.598			221 280 248 571	21.06	15.827	13.583	3.307	4.173	4.567	1.890	.433	220.5	21	M 16x 75	24	185
350	13.780		12.598 12.992			274 387 295 040	21.46	16.260	13.976	3.937	4.803	5.315	2.126	.433	264.6	16	M 20x 90	30	362
360	14.173	+0 -.0035	12.992 13.780			265 536 306 104	21.85	16.654	14.370	3.937	4.803	5.315	2.126	.433	275.6	16	M 20x 90	30	362
380	14.961		13.780 13.386 14.173	.0044	.460	320 856 344 459	23.03	17.402	15.236	4.409	5.354	5.866	2.362	.472	330.7	18	M 20x100	30	362
390	15.354		14.173 13.780			372 488 425 595	23.43	17.795	15.630	4.409	5.354	5.866	2.362	.472	343.9	20	M 20x100	30	362
400	15.748		13.780 14.567 15.354			405 680 461 738	24.21	18.189	16.024	4.409	5.354	5.866	2.362	.472	374.8	21	M 20x100	30	362
420	16.535		15.354 16.142			426 333 483 128	24.80	19.094	16.811	4.724	5.669	6.181	2.520	.472	407.9	22	M 20x100	30	362
440	17.323		16.142 16.732			499 355 562 051	25.98	19.882	17.598	4.724	5.669	6.181	2.520	.472	451.9	24	M 20x100	30	362
460	18.110	+0 -.0038	16.732 17.323		.500	619 584 689 656	26.97	20.748	18.425	5.197	6.220	6.732	2.795	.512	518.1	28	M 20x110	30	362
480	18.898		17.323 17.323	.0048		657 202 712 522	28.15	21.535	19.213	5.197	6.220	6.732	2.795	.512	562.2	28	M 20x110	30	362
500	19.685		17.323			727 274 786 282	29.53	22.323	20.000	5.197	6.220	6.732	2.795	.512	628.3	30	M 20x110	30	362

\* Stainless steel available upon request.

# Heavy Duty Shrink Discs® RfN 4091 Specifications

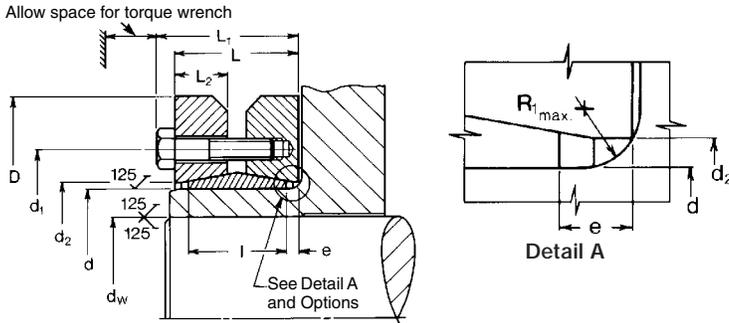
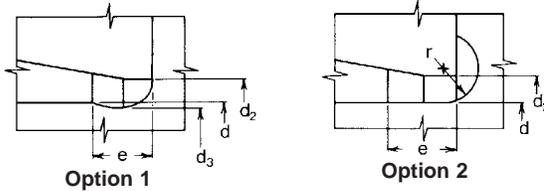


Fig. 51: Shrink Disc®



- d = nominal Shrink Disc® I.D.
- = hub projection O.D.
- $T_H$  = specified tolerance for hub O.D. (d)
- $d_W$  = shaft size range (min.- max.)
- $T_W$  = total allowable diametrical clearance between shaft and hub bore ( $d_W$ )
- $M_t$  = maximum transmissible torque
- D = Shrink Disc® O.D.
- $d_1$  = bolt circle dia.
- $d_2$  = thrust ring I.D.
- $L, L_1, L_2, e$  = width dimensions, relaxed condition
- $P_{ax}$  = axial load (thrust capacity)
- =  $\frac{M_t \times 24}{d}$  lbs (for  $M_t$  in lb-ft)
- s = head dimension across flats (mm)
- $M_A$  = required tightening torque per locking screw
- $d_3$  = 0.98 x d (for Option 1)
- r = to be selected by customer (for Option 2)

**Notes**

1. Tapers and screws lubricated with Molykote Gn Paste or equivalent.
2. For Series RfN 4091:  
 Sizes 125 to 175 have a thru-drilled tapped hole.  
 All larger sizes have a blind tapped hole.

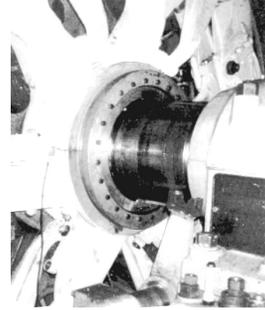
**Table 8: Heavy Duty Shrink Disc® RfN 4091**  
 Material: Alloy Steel\*

RfN 4091 Size	Shaft/Hub dimensions					max. $M_t$ lb-ft	Shrink Disc® dimensions							Locking screws DIN 931 - 10.9					
	d	$T_H$	$d_W$ inches	$T_W$	$R_{1max}$		D	$d_1$	$d_2$	I inches	L	$L_1$	$L_2$	e	Wt. lbs	Qty	Size	s mm	$M_A$ lb-ft
125	4.921		3.346 3.740			11 064 14 752	8.46	6.299	5.079	2.165	2.559	2.874	1.102	.197	24.3	10	M 12x 50	19	74
140	5.512		3.740 4.134		.265	15 195 19 546	9.06	6.890	5.669	2.362	2.913	3.228	1.260	.276	28.7	12	M 12x 55	19	74
155	6.102	+0 -.0025	4.134 4.528	.0027		21 095 26 849	10.43	7.795	6.457	2.598	3.150	3.465	1.378	.276	44.1	15	M 12x 60	19	74
165	6.496		4.528 4.921		.300	30 242 37 396	11.42	8.268	6.850	2.835	3.465	3.858	1.496	.315	57.3	10	M 16x 65	24	185
175	6.890		4.921 5.315			34 667 42 043	11.81	8.661	7.244	2.835	3.465	3.858	1.496	.315	63.9	10	M 16x 65	24	185
185	7.283		5.315 5.709			53 107 63 434	12.99	9.291	7.638	3.622	4.409	4.803	1.969	.394	103.6	14	M 16x 80	24	185
195	7.677		5.709 6.102	.0031	.380	55 320 70 810	13.78	9.685	7.835	3.622	4.409	4.803	1.969	.394	116.8	14	M 16x 80	24	185
200	7.874	+0 -.0028	6.102 6.496			62 696 73 760	13.78	9.685	8.031	3.622	4.409	4.803	1.969	.394	110.2	15	M 16x 80	24	185
220	8.661		6.496 6.890			93 675 108 058	14.57	10.630	8.819	4.488	5.276	5.669	2.362	.394	143.3	20	M 16x 90	24	185
240	9.449		6.890 7.283			114 328 146 045	15.94	11.614	9.606	4.724	5.669	6.181	2.559	.472	191.8	15	M 20x100	30	362
260	10.236		7.283 7.677			157 109 197 677	16.93	12.638	10.433	5.354	6.299	6.811	2.835	.472	220.5	18	M 20x110	30	362
280	11.024	+0 -.0032	7.677 8.071	.0035		210 216 261 848	18.11	13.622	11.220	5.827	6.772	7.283	3.071	.472	291.0	21	M 20x120	30	362
300	11.811		8.071 8.465			251 522 290 614	19.09	14.331	12.008	5.984	6.929	7.441	3.150	.472	308.6	22	M 20x120	30	362
320	12.598		8.465 8.859			278 813 332 658	20.47	15.197	12.795	6.299	7.244	7.756	3.228	.472	363.8	24	M 20x130	30	362
340	13.386		8.859 9.253			361 055 426 333	22.44	16.535	13.583	6.929	7.874	8.465	3.622	.472	529.1	21	M 24x130	36	620
350	13.780		9.253 9.647		.460	410 106 463 950	22.83	16.732	13.976	6.929	7.874	8.465	3.622	.472	544.5	21	M 24x130	36	620
360	14.173	+0 -.0035	9.647 10.041	.0040		451 411 508 206	23.23	17.008	14.370	7.087	8.031	8.622	3.622	.472	551.1	22	M 24x140	36	620
380	14.961		10.041 10.435			455 837 530 334	25.39	18.031	15.236	7.087	8.031	8.622	3.622	.472	705.5	22	M 24x140	36	620
390	15.354		10.435 10.829			522 221 600 775	25.98	18.425	15.630	7.402	8.346	8.937	3.780	.472	771.6	24	M 24x140	36	620
400	15.748		10.829 11.223			564 264 623 272	26.77	18.898	16.024	7.402	8.346	8.937	3.780	.472	815.7	24	M 24x140	36	620
420	16.535		11.223 11.617			736 862 840 864	27.17	19.843	16.811	8.425	9.370	9.961	4.370	.472	903.9	30	M 24x150	36	620
440	17.323		11.617 12.011			780 381 888 070	29.53	20.748	17.638	8.819	9.921	10.591	4.528	.551	1190.5	24	M 27x170	41	922
460	18.110	+0 -.0038	12.011 12.405	.0044		973 632 1106 400	30.31	21.535	18.425	8.819	9.921	10.591	4.528	.551	1190.5	28	M 27x170	41	922
480	18.898		12.405 12.799		.540	1132 216 1268 672	31.50	22.835	19.213	9.685	10.787	11.457	5.039	.551	1433.0	30	M 27x180	41	922
500	19.685		12.799 13.193	.0048		1290 800 1430 944	33.46	23.622	20.000	9.685	10.787	11.457	5.039	.551	1653.5	32	M 27x180	41	92

\* Stainless steel available upon request.

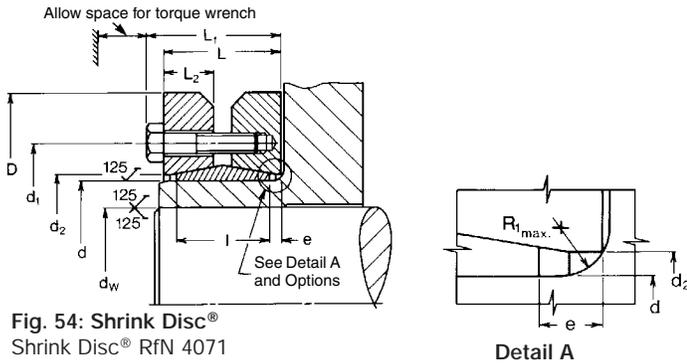


**Fig. 52: Shrink Disc®**  
900 RfN 4091 Shrink Disc® mounting a flange on a 29.5" dia. shaft for the brake unit of a larger vertical Darius style wind generator.

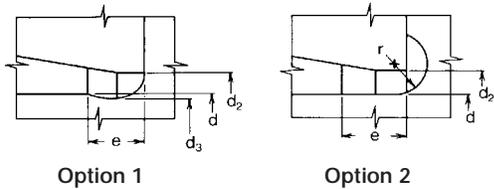


**Fig. 53: Hoist Clutch Spider**  
Gold mine hoist clutch spider mounted on a 30.0" dia. shaft requiring a 950 RfN 4071-SR Split Shrink Disc®.

## Extra Large Shrink Discs® RfN 4071 Specifications



**Fig. 54: Shrink Disc®**  
Shrink Disc® RfN 4071



- d = nominal Shrink Disc® I.D.
- = hub projection O.D.
- $T_H$  = specified tolerance for hub O.D. (d)
- $d_W$  = shaft size range (min.- max.)
- $T_W$  = total allowable diametrical clearance between shaft and hub bore ( $d_W$ )
- $M_t$  = maximum transmissible torque
- D = Shrink Disc® O.D.
- $d_1$  = bolt circle dia.
- $d_2$  = thrust ring I.D.
- $L, L_1, L_2, e$  = width dimensions, relaxed condition
- $P_{ax}$  = axial load (thrust capacity)
- =  $\frac{M_t \times 24}{d}$  lbs (for  $M_t$  in lb-ft)
- s = head dimension across flats (mm)
- p' = contact pressure between Locking Assembly™ and hub bore
- $M_A$  = required tightening torque per locking screw
- $d_3$  = 0.98 x d (for Option 1)
- r = to be selected by customer (for Option 2)

**Note** Tapers and screws lubricated with Molykote Gn Paste or equivalent.

**Ordering Example**

	Size	RfN	Series
Example:	750	RfN	4071

**Table 9: Extra Large Shrink Disc® RfN 4071**

Material: Alloy Steel

RfN 4071 Size	Shaft/Hub dimensions					max. $M_t$ lb-ft	Shrink Disc® dimensions							Locking screws DIN 931 - 10.9				
	d	$T_H$	$d_W$ inches	$T_W$	$R_{1max}$		D	$d_1$	$d_2$	l inches	L	$L_1$	$L_2$	e	Wt. lbs	Qty	Size	s mm
530	20.866		16.929 17.717		.480	35.43	24.409	21.181	8.465	9.449	10.118	4.134	.492	1554	30	M 27x180	41	922
560	22.047		17.717 18.504	.0048		37.40	25.591	22.362	8.465	9.449	10.118	4.134	.492	1720	32	M 27x180	41	922
590	23.228	-0.0043	18.504 19.291			38.58	26.969	23.622	9.252	10.433	11.102	4.528	.591	1962	36	M 27x180	41	922
620	24.409		19.685 20.472			40.16	28.150	24.803	9.252	10.433	11.102	4.528	.591	2094	38	M 27x180	41	922
660	25.984		20.866 21.654		.580	43.31	29.921	26.378	10.236	11.417	12.165	4.921	.591	2734	38	M 30x220	46	1254
700	27.559		22.047 23.228			47.24	31.496	27.953	10.236	11.417	12.165	4.921	.591	3351	40	M 30x220	46	1254
750	29.528	-0.0049	23.622 25.197			48.43	33.661	30.000	11.024	12.402	13.150	5.433	.689	3616	44	M 30x220	46	1254
800	31.496		25.197 26.772			51.57	35.630	31.969	11.024	12.402	13.150	5.433	.689	4090	46	M 30x220	46	1254
850	33.465		26.772 28.346	.0060		52.36	37.992	33.937	12.205	13.583	14.331	5.906	.689	4409	50	M 30x250	46	1254
900	35.433		28.346 29.921			55.12	39.961	35.906	12.205	13.583	14.331	5.906	.689	4850	52	M 30x250	46	1254
950	37.402	-0.0055	29.921 31.496			61.02	42.323	37.874	13.386	14.961	15.866	6.614	.787	6922	48	M 36x260	55	2028
1000	39.370		31.496 33.071	.0067	.775	63.78	44.291	39.843	13.386	14.961	15.866	6.614	.787	7496	50	M 36x260	55	2028

### INSTALLATION

*Note: Never tighten the locking screws before the shaft is inside the hub, otherwise the hub projection may be deformed.*

#### A. Shrink Discs® and Split Shrink Discs®

1. Remove the shipping spacers and screws, if any, provided for protection during shipping.
2. Verify the lubrication of the supplied locking screw threads, screw head bearing area and tapers of the inner rings. If necessary, lubricate them with a molybdenum disulfide grease, such as Molykote Gn Paste.

##### a) Standard Shrink Discs®

Slide Shrink Disc® over the corresponding hub projection. The hub outside diameter may be greased.

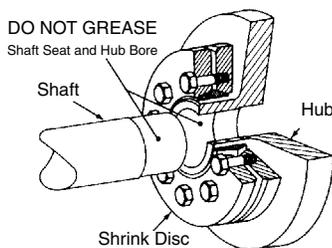


Fig. 55: Shrink Disc®

##### b) Split Shrink Discs®

Slide each half of the Split Shrink Disc® over the corresponding hub projection and align them as required. The hub outside diameter may be greased. Insert the locking screws through the collar and web clearance holes and screw them into the opposite collar (see Fig. 56: Split Shrink Disc®).

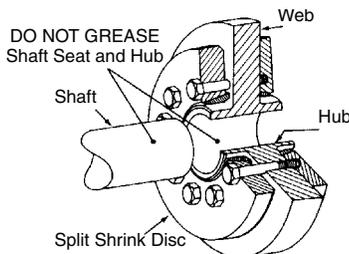


Fig. 56: Split Shrink Disc®

3. Clean and lightly oil the hub bore and shaft seat.
4. Insert the shaft or slide the hub into position over the shaft.
5. Tighten 3 or 4 locking screws that are equally spaced around the diameter to establish a parallel or perpendicular position of Shrink Disc® collar(s) relative to hub web or shaft, respectively. This step properly seats the collar(s) on the taper of the inner ring.
6. Using a torque wrench, tighten all locking screws gradually and in sequence all the way around (not in a diametrically opposite sequence).

Several passes may be required until all screws are torqued to the specified tightening torque ( $M_A$ ).

7. Verify that the screws are completely tight by applying the specified tightening torque ( $M_A$ ).

The gap between the Shrink Disc® collars or between the Shrink Disc® collar and the hub should be even all the way around.

#### B. Half Shrink Discs® - Type HC (clearance holes in collar)

1. Remove the half Shrink Disc® (collar and inner ring) and screws from the shipping container.
2. Verify the lubrication of the supplied locking screw threads, screw head bearing area and tapers of the inner rings. If necessary, lubricate them with a molybdenum disulfide grease, such as Molykote Gn Paste.
3. Slide the half Shrink Disc® (collar and inner ring) over the hub projection and position it as required. The hub outside diameter may be greased.
4. Insert the locking screws through the collar clearance holes and screw them into the corresponding tapped holes (see Fig. 57: Half Shrink Discs®).
5. Perform Steps A3 to A7 above.

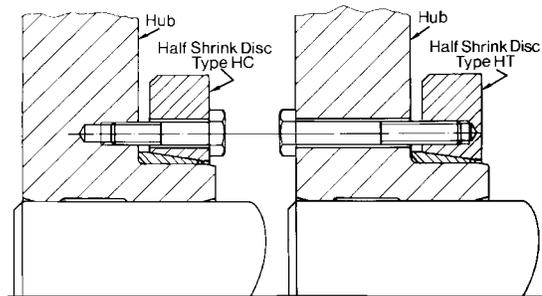


Fig. 57: Half Shrink Discs®

#### C. Half Shrink Discs® - Type HT (threaded holes in collar)

1. Remove the half Shrink Disc® (collar and inner ring) and screws from the shipping container.
2. Verify the lubrication of the supplied locking screw threads, screw head bearing area and tapers of the inner rings. If necessary, lubricate them with a molybdenum disulfide grease, such as Molykote Gn Paste.
3. Slide the half Shrink Disc® (collar and inner ring) over the hub projection and position it as required. The hub outside diameter may be greased.
4. Insert the locking screws through the web clearance holes and screw them into the corresponding collar holes (see Fig. 57: Half Shrink Discs®).

*Note: Cast-iron webs may require hardened washers under the fastener head. Consult Ringfeder Corporation.*

5. Perform Steps A3 to A7 above.

### REMOVAL

The removal procedure is the same for all Shrink Disc® types.

1. Gradually release the locking screws all the way around. Begin by releasing each screw only about one-quarter of a turn to avoid jamming the collars.

*Note: Do NOT remove screws completely yet. The collar may spring off.*

2. Any rust formed around the hub must first be removed. Once the screws are loose, remove the shaft or pull the hub from the shaft.

### REINSTALLATION

After removal of an existing component, disassemble the Shrink Disc®. Clean and inspect all parts. Reinstall the assembly beginning with Step 2 of the applicable section procedure above.



## Ringfeder® Split Shrink Discs®

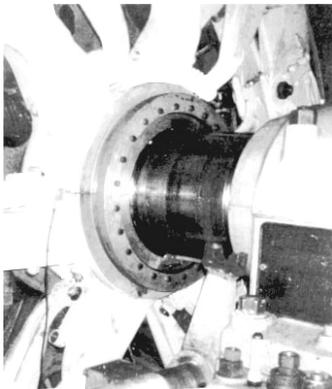
RfN 4071-SR, RfN 4091-SR & RfN 4051-SR

Ringfeder® split Shrink Disc® design is a modified version of our standard Shrink Discs® with split inner rings.

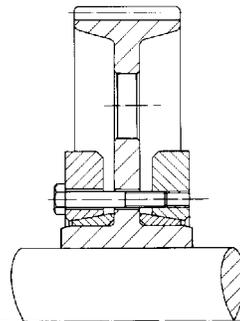
This configuration offers greater mounting versatility, allows symmetrical hub designs and permits the use of half Shrink Discs® in many special applications, while maintaining all the characteristics and advantages of our standard Shrink Discs®.



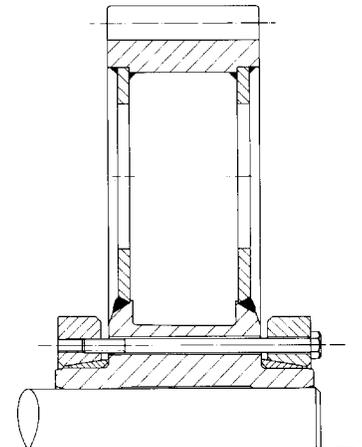
## Applications and Design Examples



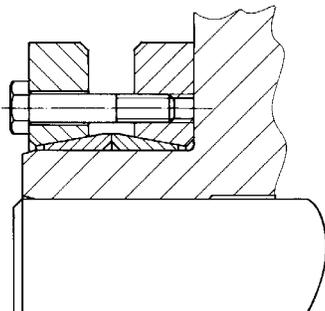
**Fig. 58: Hoist Clutch Spider**  
Gold mine hoist clutch spider mounted with a Split Shrink Disc®.



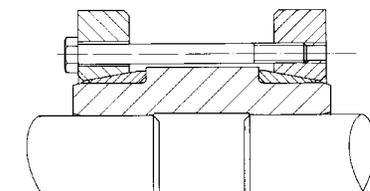
**Fig. 59: Gear**  
Gear mounted with a Split Shrink Disc® RfN 4071-SR. The split Shrink Disc® becomes an integral part of the gear and provides symmetrical clamping.



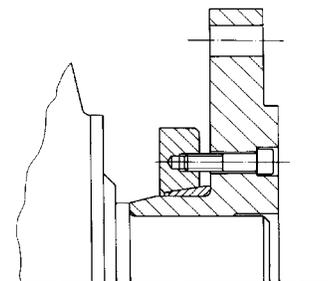
**Fig. 60: Large Gear**  
Large gear mounted with Split Shrink Disc® and extended bolts.



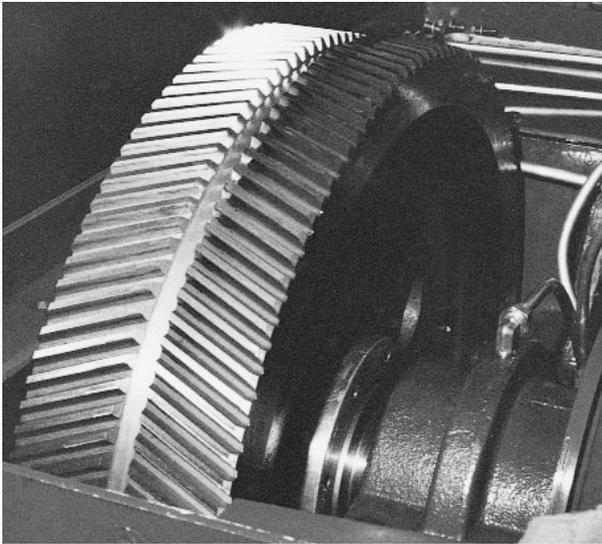
**Fig. 61**  
Split Shrink Disc® RfN 4071-SR mounted on one side of a hub, a projection like type RfN 4071.



**Fig. 62: Rigid Coupling**  
Split Shrink Disc® rigid coupling. This complete coupling locks onto both shafts at the same time and releases just as quickly. The coupling can join dissimilar shafts, for example in retrofit applications.



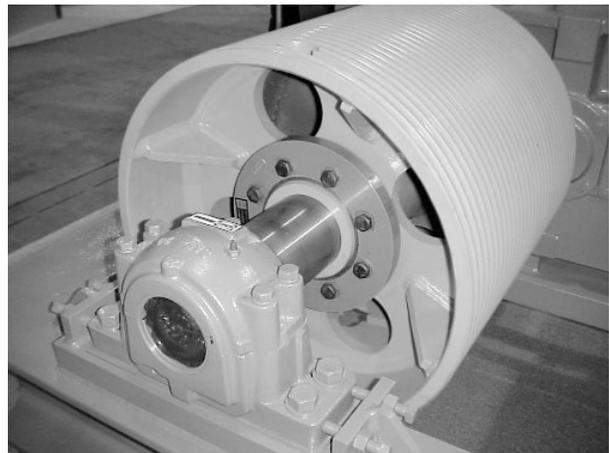
**Fig. 63: Adaptor Flange**  
Split Shrink Disc® adaptor flanges can be made to accommodate a wide variety of constraints.



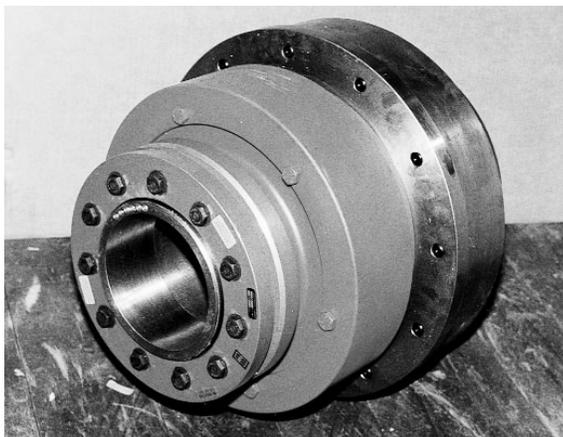
**Fig. 65: Split Shrink Disc® 125 RfN 4051 – SR**  
Used to mount herringbone gear on homogenizer.



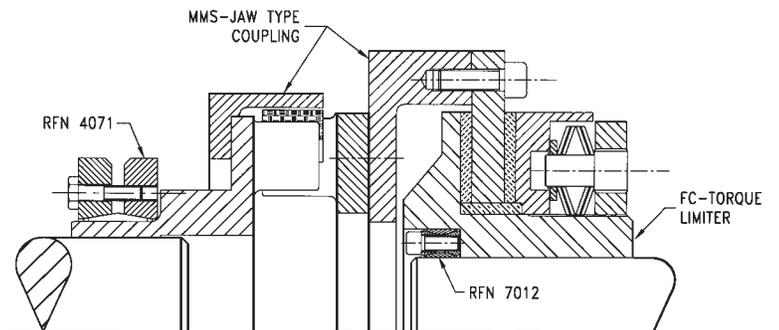
**Fig. 64: Gear**  
Gear fastened with a Split Shrink Disc®.



**Fig. 66: Split Shrink Disc® 195 RfN 4071 – SR**  
On carriage drive in sawmill.



**Fig. 67-a**  
Drive coupling consisting of combination torque limiter FC 350 and MMS 1000 coupling for people mover at an airport. The coupling half is mounted with a 4071 Shrink Disc®.



**Fig. 67-b**

1. Determine the shaft diameter ( $d_w$ ) to be used or the maximum torque ( $M_t$ ) to be transmitted.

*Note: For hollow shaft applications, please consult Ringfeder Corporation.*

2. Select a Shrink Disc® from the appropriate Table for the required shaft diameter ( $d_w$ ). Verify that the corresponding maximum transmissible torque ( $M_t$ ) meets the torque requirement. For half Shrink Discs®, Type HC or HT, Consult Ringfeder Corporation for screw length and type.

If torque is the primary requirement, select the necessary torque ( $M_t$ ) from Table and determine the corresponding shaft diameter ( $d_w$ ).

3. Incorporate the specified dimensions of the selected Shrink Disc® and required hub into your design and drawing. Indicate the specified tightening torque ( $M_A$ ) for each locking screw on the drawing.

4. Establish machining tolerances ( $T_H$ ,  $T_W$ ) for the shaft, hub bore and hub outer diameter from the specification tables in next section.

*Transmissible torque ( $M_t$ ) is one-half of torque specified in tables, for Half Shrink Discs®.*

*Screw threads and screw head bearing area must be lubricated with Molykote Gn Paste or the like and tightened to specified torque ( $M_A$ ).*

#### Ordering Example

	Size	RfN	Series-Type	X = (?)
Split Shrink Disc®:	140	RfN	4071-SR	X = 2"
Half Shrink Disc®:	140	RfN	4071-HT	X = 2"

## Split Shrink Discs® and Half Shrink Discs® RfN 4071 Specifications

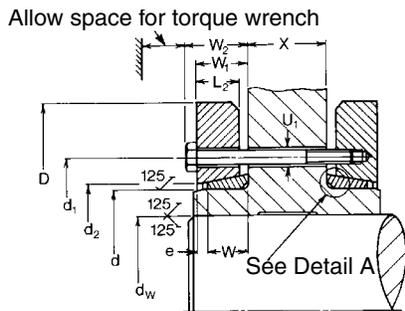


Fig. 68: Split Shrink Disc®

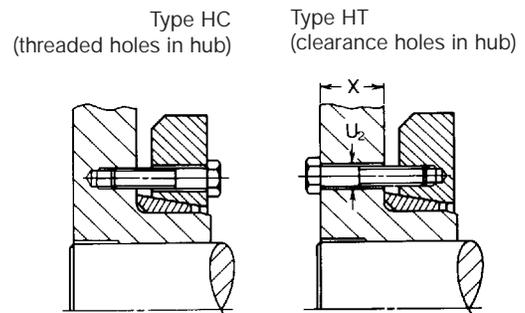
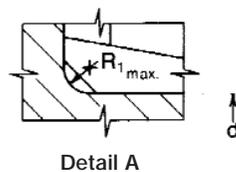


Fig. 69: Half Shrink Discs®

d	= nominal Shrink Disc® I.D. = hub projection O.D.
$T_H$	= specified tolerance for hub O.D. (d)
$d_w$	= shaft size range (min. - max.)
$T_W$	= total allowable diametrical clearance between shaft and hub bore ( $d_w$ )
$M_t$	= maximum transmissible torque for split Shrink Disc®
D	= Shrink Disc® O.D.
$d_1$	= bolt circle dia.
$d_2$	= thrust ring I.D.
$W_1, L_2, W_2, e$	= width dimensions, relaxed condition
s	= head dimension across flats (mm)

$U_1, U_2$	= thru-bolt clearance hole(s) (standard drill sizes expressed in decimals)
$M_A$	= required tightening torque per locking screw (same for both split and half Shrink Discs®)
$P_{ax}$	= axial load (thrust capacity)
	= $\frac{M_t \times 24}{d_w}$ lbs (for $M_t$ in lb-ft)

*Note: If dimension X is larger than 4 x  $W_1$ ,  $M_t$  may be reduced. With half Shrink Discs® only 50% of stated  $M_t$  is transmitted.*

#### Notes for Table 10

1. Tapers and screws lubricated with Molykote Gn Paste or equivalent.
2. For Series RfN 4071: Sizes 24 to 200 have a thru-drilled tapped hole.
3. For Series RfN 4051: Sizes 125 to 260 have a thru-drilled tapped hole.
4. For Series RfN 4091: Sizes 125 to 175 have a thru-drilled tapped hole.
5. All larger sizes have a blind tapped hole.

**Table 10: Split Shrink Disc® RfN 4071-SR**  
 Material: Alloy Steel\*

RfN 4071 Size	Shaft/Hub dimensions					max. M <sub>t</sub> lb-ft	Shrink Disc® dimensions								Locking screws DIN 931 - 10.9					
	d	T <sub>H</sub>	d <sub>W</sub> inches	T <sub>W</sub>	R <sub>1max.</sub>		D	d <sub>1</sub>	d <sub>2</sub>	W inches	W <sub>1</sub>	W <sub>2</sub>	L <sub>2</sub>	e	Qty	Size	s mm	U <sub>1</sub> inches	U <sub>2</sub>	M <sub>A</sub> lb-ft
24	.945	+0	.748 .827	↑	↑	125 184	1.97	1.417	1.024	.354	.463	.600	.315	.108	6	M 5	8	.281	.219	3
30	1.181	-0.0013	.945 1.024	↓	↓	221 273	2.36	1.732	1.260	.394	.502	.640	.354	.108	7	M 5	8	.281	.219	3
36	1.417	↑	1.102 1.220	↑	↓	325 465	2.83	2.047	1.496	.433	.541	.699	.394	.108	5	M 6	10	.328	.266	9
44	1.732	+0	1.339 1.417	↑	↑	524 634	3.15	2.402	1.850	.492	.600	.758	.433	.108	7	M 6	10	.328	.266	9
50	1.969	-0.0015	1.496 1.654	↓	↓	693 1 018	3.54	2.756	2.087	.531	.640	.797	.472	.108	8	M 6	10	.328	.266	9
55	2.165	↑	1.654 1.890	↑	↓	856 1 387	3.94	2.953	2.283	.551	.699	.856	.512	.148	8	M 6	10	.328	.266	9
62	2.441	↑	1.890 2.047	↑	↓	1 365 1 770	4.33	3.386	2.598	.551	.699	.856	.512	.148	10	M 6	10	.328	.266	9
68	2.677	+0	1.969 2.362	↑	↓	1 475 2 323	4.53	3.386	2.835	.551	.699	.856	.512	.148	10	M 6	10	.328	.266	9
75	2.953	-0.0018	2.165 2.559	↓	↑	1 844 2 914	5.43	3.937	3.110	.630	.778	.994	.551	.148	7	M 8	13	.406	.359	22
80	3.150	↑	2.362 2.756	↑	↓	2 360 3 393	5.71	3.937	3.307	.630	.778	.994	.551	.148	7	M 8	13	.406	.359	22
90	3.543	↑	2.559 2.953	↑	↑	3 504 5 348	6.10	4.488	3.701	.728	.906	1.122	.669	.177	10	M 8	13	.406	.359	22
100	3.937	+0	2.756 3.150	↑	↓	5 089 6 638	6.69	4.822	4.094	.807	1.004	1.220	.748	.197	12	M 8	13	.406	.359	22
110	4.331	-0.0021	2.953 3.346	↓	↓	5 311 7 966	7.28	5.354	4.488	.906	1.122	1.398	.866	.217	9	M10	17	.500	.438	44
125	4.921	↑	3.346 3.740	↑	↑	8 114 11 064	8.46	6.299	5.276	1.024	1.260	1.535	.906	.236	12	M10	17	.500	.438	44
140	5.512	↑	3.740 4.134	↑	↓	11 138 14 826	9.06	6.890	5.748	1.102	1.388	1.703	1.024	.285	10	M12	19	.594	.531	74
155	6.102	+0	4.134 4.528	↑	↑	16 227 20 653	10.43	7.559	6.496	1.181	1.467	1.781	1.102	.285	12	M12	19	.594	.531	74
165	6.496	-0.0025	4.528 4.921	↓	↓	22 866 28 766	11.42	8.268	6.890	1.299	1.594	1.988	1.220	.295	8	M16	24	.750	.719	185
175	6.890	↑	4.921 5.315	↑	↑	26 554 33 192	11.81	8.661	7.283	1.299	1.594	1.988	1.220	.295	8	M16	24	.750	.719	185
185	7.283	↑	5.315 5.709	↑	↓	38 355 45 731	12.99	9.291	7.677	1.594	1.890	2.283	1.496	.295	10	M16	24	.750	.719	185
195	7.677	↑	5.709 6.102	↑	↑	47 944 60 114	13.78	9.685	8.268	1.594	1.890	2.283	1.496	.295	12	M16	24	.750	.719	185
200	7.874	+0	5.906 6.299	↑	↓	54 582 63 434	13.78	9.685	8.268	1.594	1.890	2.283	1.496	.295	12	M16	24	.750	.719	185
220	8.661	-0.0028	6.299 6.693	↓	↑	70 072 81 136	14.57	10.630	9.055	2.028	2.343	2.736	1.850	.315	15	M16	24	.750	.719	185
240	9.449	↑	6.693 7.480	↑	↓	88 512 115 066	15.94	11.614	9.764	2.106	2.441	2.953	1.929	.335	12	M20	30	.906	.875	362
260	10.236	↑	7.480 8.268	↑	↑	120 966 151 208	16.93	12.638	10.551	2.323	2.657	3.169	2.126	.335	14	M20	30	.906	.875	362
280	11.024	+0	8.268 9.055	↑	↓	160 059 199 152	18.11	13.622	11.339	2.579	2.972	3.484	2.362	.394	16	M20	30	.906	.875	362
300	11.811	-0.0032	9.055 9.646	↓	↑	202 840 232 344	19.09	14.331	12.126	2.736	3.130	3.642	2.520	.394	18	M20	30	.906	.875	362
320	12.598	↑	9.646 10.236	↑	↓	230 131 275 862	20.47	15.197	12.913	2.736	3.130	3.642	2.520	.394	20	M20	30	.906	.875	362
340	13.386	↑	10.236 10.630	↑	↑	287 664 339 296	22.44	16.063	13.701	2.972	3.406	3.917	2.795	.433	24	M20	30	.906	.875	362
350	13.780	↑	10.630 11.220	↑	↓	326 019 368 800	22.83	17.008	14.094	3.091	3.524	4.035	2.874	.433	24	M20	30	.906	.875	362
360	14.173	+0	11.220 11.614	↑	↑	341 509 385 027	23.23	17.008	14.488	3.091	3.524	4.035	2.874	.433	24	M20	30	.906	.875	362
380	14.961	-0.0035	11.614 12.205	↓	↓	418 219 485 341	25.39	18.031	15.236	3.169	3.642	4.232	2.992	.472	20	M24	36	1.063	1.031	620
390	15.354	↑	12.205 12.598	↑	↑	460 262 529 597	25.98	18.425	15.630	3.169	3.642	4.232	2.992	.472	21	M24	36	1.063	1.031	620
400	15.748	↑	12.598 12.992	↑	↓	494 192 548 774	26.77	18.898	16.024	3.169	3.642	4.232	2.992	.472	21	M24	36	1.063	1.031	620
420	16.535	↑	12.992 13.780	↑	↑	575 328 663 840	27.17	19.843	16.811	3.720	4.193	4.783	3.386	.472	24	M24	36	1.063	1.031	620
440	17.323	↑	13.780 13.886	↑	↓	594 506 676 379	29.53	20.748	17.598	3.976	4.469	5.059	3.583	.492	24	M24	36	1.063	1.031	620
460	18.110	+0	14.173 14.961	↑	↑	737 600 840 864	30.31	21.535	18.425	3.976	4.469	5.059	3.583	.492	28	M24	36	1.063	1.031	620
480	18.898	-0.0038	14.961 15.748	↓	↓	862 992 966 256	31.50	22.441	19.213	4.193	4.685	5.276	3.780	.492	30	M24	36	1.063	1.031	620
500	19.685	↑	15.748 16.535	↑	↑	967 731 1 073 208	33.46	23.228	20.000	4.193	4.685	5.354	3.780	.492	24	M27	41	1.188	1.156	922

\* Stainless steel available upon request.

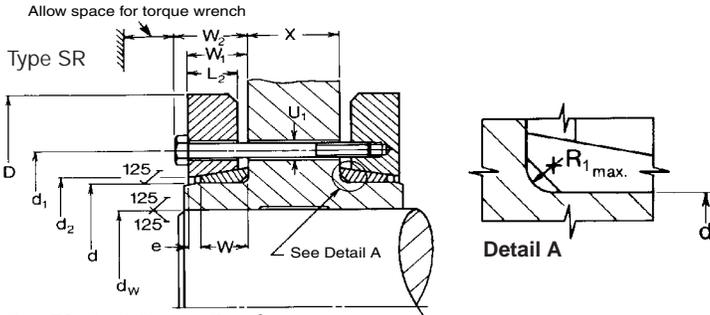


Fig. 70: Split Shrink Disc®

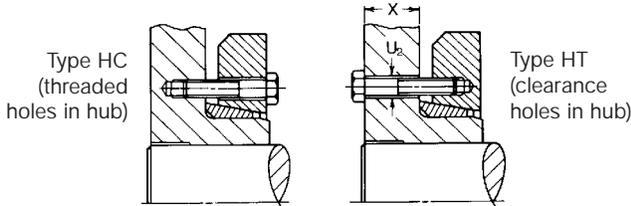


Fig. 71: Half Shrink Discs®

- d = nominal Shrink Disc® I.D.
- = hub projection O.D.
- $T_H$  = specified tolerance for hub O.D. (d)
- $d_w$  = shaft size range (min.- max.)
- $T_W$  = total allowable diametrical clearance between shaft and hub bore ( $d_w$ )
- $M_t$  = maximum transmissible torque
- D = Shrink Disc® O.D.
- $d_1$  = bolt circle dia.
- $d_2$  = thrust ring I.D.
- $P_{ax}$  = axial load (thrust capacity)
- =  $\frac{M_t \times 24}{d_w}$  lbs (for  $M_t$  in lb-ft)

Note: If dimension X is larger than  $4xW_1$ ,  $M_t$  may be reduced. With half Shrink Discs® only 50% of stated  $M_t$  is transmitted.

- $W_1, W_2, e$  = width dimensions, relaxed condition
- s = head dim. across flats (mm)
- $U_1, U_2$  = thru-bolt clearance hole(s) (standard drill sizes expressed in decimals)
- $M_A$  = required tightening torque per locking screw (same for both split and half Shrink Discs®)

Notes 1. Tapers and screws lubricated with Molykote Gn paste or equivalent.

**Table 11: Light Duty Split Shrink Disc® RfN 4051-SR**  
Material: Alloy Steel\*

RfN 4051 Size	Shaft/Hub dimensions					max. $M_t$ lb-ft	Shrink Disc® dimensions							Locking screws DIN 931 - 10.9						
	d	$T_H$	$d_w$ inches	$T_W$	$R_{1max}$		D	$d_1$	$d_2$	W inches	$W_1$	$W_2$	$L_2$	e	Qty	Size	s mm	$U_1$ inches	$U_2$	$M_A$ lb-ft
125	4.921		3.740			7 782	7.28	6.220	5.079	.965	1.201	1.476	.866	.236	8	M10	17	.500	.438	44
			4.134			10 179														
140	5.512		4.331			10 916	8.66	6.890	5.669	.965	1.201	1.476	.866	.236	9	M10	17	.500	.438	44
			4.921			15 121														
155	6.102		5.118			17 702	9.65	7.559	6.260	.965	1.201	1.476	.866	.236	11	M10	17	.500	.438	44
			5.512			21 390														
165	6.496		5.315			23 603	10.24	8.268	6.654	1.102	1.417	1.732	1.024	.315	10	M12	19	.594	.531	74
			5.709			28 398														
175	6.890		5.709			28 766	10.83	8.661	7.047	1.102	1.417	1.732	1.024	.315	11	M12	19	.594	.531	74
			6.102			33 930														
185	7.283		6.102			34 372	11.61	8.858	7.441	1.102	1.417	1.732	1.024	.315	12	M12	19	.594	.531	74
			6.496			39 830														
195	7.677		6.496			46 469	12.40	9.331	7.835	1.299	1.614	1.929	1.220	.315	15	M12	19	.594	.531	74
			6.890			53 476														
200	7.874		6.890			54 582	12.99	9.528	8.031	1.299	1.614	1.929	1.220	.315	16	M12	19	.594	.531	74
			7.283			62 327														
220	8.661		7.087			61 073	13.58	10.433	8.819	1.496	1.850	2.244	1.417	.354	10	M16	24	.750	.719	185
			7.874			77 448														
240	9.449		7.874			83 349	14.57	11.417	9.606	1.496	1.850	2.244	1.417	.354	12	M16	24	.750	.719	185
			8.465			99 207														
260	10.236		8.661			109 902	15.55	12.205	10.433	1.713	2.067	2.461	1.575	.354	14	M16	24	.750	.719	185
			9.252			127 605														
280	11.024		9.055			126 130	16.73	13.110	11.220	1.949	2.343	2.736	1.811	.394	16	M16	24	.750	.719	185
			9.843			153 421														
300	11.811		9.843			158 584	18.11	14.094	12.008	1.949	2.343	2.736	1.811	.394	18	M16	24	.750	.719	185
			10.630			188 088														
320	12.598		10.630			191 776	19.49	14.882	12.795	1.949	2.382	2.776	1.890	.433	20	M16	24	.750	.719	185
			11.417			225 706														
340	13.386		11.417			221 280	21.06	15.827	13.583	1.949	2.382	2.776	1.890	.433	21	M16	24	.750	.719	185
			12.008			248 571														
350	13.780		11.811			274 387	21.46	16.260	13.976	2.264	2.697	3.209	2.126	.433	16	M20	30	.906	.875	362
			12.205			295 040														
360	14.173		11.811			265 536	21.85	16.654	14.370	2.264	2.697	3.209	2.126	.433	16	M20	30	.906	.875	362
			12.598			306 104														
380	14.961		12.598			320 856	23.03	17.402	15.236	2.500	2.972	3.484	2.362	.472	18	M20	30	.906	.875	362
			12.992			344 459														
390	15.354		12.992			372 488	23.43	17.795	15.630	2.598	3.071	3.583	2.362	.472	20	M20	30	.906	.875	362
			13.780			425 595														
400	15.748		13.386			405 680	24.21	18.189	16.024	2.598	3.071	3.583	2.362	.472	21	M20	30	.906	.875	362
			14.173			461 738														
420	16.535		13.780			426 333	24.80	19.094	16.811	2.756	3.228	3.740	2.520	.472	22	M20	30	.906	.875	362
			14.567			483 128														
440	17.323		14.567			499 355	25.98	19.882	17.598	2.756	3.228	3.740	2.520	.472	24	M20	30	.906	.875	362
			15.354			562 051														
460	18.110		15.354			619 584	26.97	20.748	18.425	3.091	3.602	4.114	2.795	.512	28	M20	30	.906	.875	362
			16.142			689 656														
480	18.898		16.142			657 202	28.15	21.535	19.213	3.091	3.602	4.114	2.795	.512	28	M20	30	.906	.875	362
			16.732			712 522														
500	19.685		16.732			727 274	29.53	22.323	20.000	3.091	3.602	4.114	2.795	.512	30	M20	30	.906	.875	362
			17.323			786 282														

\* Stainless steel available upon request.

# Heavy Duty Split Shrink Discs® RfN 4091-SR Specifications

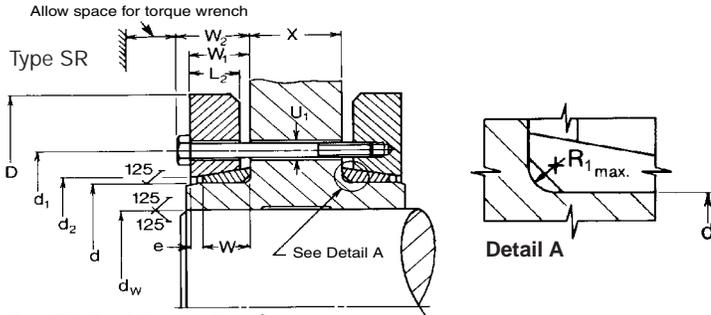


Fig. 72: Split Shrink Disc®

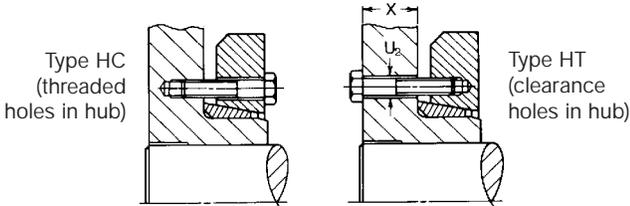


Fig. 73: Half Shrink Discs®

- d = nominal Shrink Disc® I.D.
  - = hub projection O.D.
  - $T_H$  = specified tolerance for hub O.D. (d)
  - $d_W$  = shaft size range (min. - max.)
  - $T_W$  = total allowable diametrical clearance between shaft and hub bore ( $d_W$ )
  - $M_t$  = maximum transmissible torque
  - D = Shrink Disc® O.D.
  - $d_1$  = bolt circle dia.
  - $d_2$  = thrust ring I.D.
  - $P_{ax}$  = axial load (thrust capacity)
- $$= \frac{M_t \times 24}{d_W} \text{ lbs (for } M_t \text{ in lb-ft)}$$

Note: If dimension X is larger than  $4xW_1$ ,  $M_t$  may be reduced. With half Shrink Discs™ only 50% of stated  $M_t$  is transmitted.

- $W_1, W_2, e$  = width dimensions, relaxed condition
- s = head dim. across flats (mm)
- $U_1, U_2$  = thru-bolt clearance hole(s) (standard drill sizes expressed in decimals)
- $M_A$  = required tightening torque per locking screw (same for both split and half Shrink Discs™)

- Notes
1. Tapers and screws lubricated with Molykote Gn paste or equivalent.
  2. For Series RfN 4091: Sizes 125 to 175 have a thru-drilled tapped hole.
  3. All larger sizes have a blind tapped hole.

Table 12: Heavy Duty Split Shrink Disc® RfN 4091-SR  
Material: Alloy Steel\*

RfN 4091 Size	Shaft/Hub dimensions					max. $M_t$ lb-ft	Shrink Disc® dimensions							Locking screws DIN 931 - 10.9						
	d	$T_H$	$d_W$ inches	$T_W$	$R_{1max.}$		D	$d_1$	$d_2$	W inches	$W_1$	$W_2$	$L_2$	e	Qty	Size	s mm	$U_1$ inches	$U_2$	$M_A$ lb-ft
125	4.921		3.346 3.740		.130	11 064 14 752	8.46	6.299	5.079	1.280	1.476	1.791	1.102	.197	10	M12	19	.594	.531	74
140	5.512		3.740 4.134			15 195 19 546	9.06	6.890	5.669	1.378	1.654	1.969	1.260	.276	12	M12	19	.594	.531	74
155	6.102	+0 -.0025	4.134 4.528	.0027		21 095 26 849	10.43	7.795	6.457	1.496	1.772	2.087	1.378	.276	15	M12	19	.594	.531	74
165	6.496		4.528 4.921			30 242 37 396	11.42	8.268	6.850	1.614	1.929	2.323	1.496	.315	10	M16	24	.750	.719	185
175	6.890		4.921 5.315		.190	34 667 42 043	11.81	8.661	7.244	1.614	1.929	2.323	1.496	.315	10	M16	24	.750	.719	185
185	7.283		5.315 5.709			53 107 63 434	12.99	9.291	7.638	2.008	2.402	2.795	1.969	.394	14	M16	24	.750	.719	185
195	7.677		5.709 6.102			55 320 70 810	13.78	9.685	7.835	2.008	2.402	2.795	1.969	.394	14	M16	24	.750	.719	185
200	7.874	+0 -.0028	6.102 6.299	.0031		62 696 73 760	13.78	9.685	8.031	2.136	2.500	2.894	1.969	.394	15	M16	24	.750	.719	185
220	8.661		6.299 6.693			93 675 108 058	14.57	10.630	8.819	2.539	2.933	3.327	2.362	.394	20	M16	24	.750	.719	185
240	9.449		6.693 7.480		.250	114 328 146 045	15.94	11.614	9.606	2.657	3.130	3.642	2.559	.472	15	M20	30	.906	.875	362
260	10.236		7.480 8.268			157 109 197 677	16.93	12.638	10.433	2.972	3.445	3.957	2.835	.472	18	M20	30	.906	.875	362
280	11.024	+0 -.0032	8.268 9.055	.0035		210 216 261 848	18.11	13.622	11.220	3.307	3.780	4.291	3.071	.472	21	M20	30	.906	.875	362
300	11.811		9.055 9.646			251 522 290 614	19.09	14.331	12.008	3.386	3.858	4.370	3.150	.472	22	M20	30	.906	.875	362
320	12.598		9.646 9.449		.330	278 813 332 658	20.47	15.197	12.795	3.543	4.016	4.528	3.228	.472	24	M20	30	.906	.875	362
340	13.386		10.236 9.843			361 055 426 333	22.44	16.535	13.583	3.858	4.331	4.921	3.622	.472	21	M24	36	1.063	1.031	620
350	13.780		10.630 11.220			410 106 463 950	22.83	16.732	13.976	3.858	4.331	4.921	3.622	.472	21	M24	36	1.063	1.031	620
360	14.173	+0 -.0035	11.024 11.614	.0040		451 411 508 206	23.23	17.008	14.370	4.035	4.508	5.098	3.622	.472	22	M24	36	1.063	1.031	620
380	14.961		11.614 11.417			455 837 530 334	25.39	18.031	15.236	4.035	4.508	5.098	3.622	.472	22	M24	36	1.063	1.031	620
390	15.354		12.205 11.811			522 221 600 775	25.98	18.425	15.630	4.193	4.665	5.256	3.780	.472	24	M24	36	1.063	1.031	620
400	15.748		12.598 12.402		.390	564 264 623 272	26.77	18.898	16.024	4.193	4.665	5.256	3.780	.472	24	M24	36	1.063	1.031	620
420	16.535		12.992 13.780			736 862 840 864	27.17	19.843	16.811	4.705	5.177	5.768	4.370	.472	30	M24	36	1.063	1.031	620
440	17.323		13.386 14.173	.0044		780 381 888 070	29.53	20.748	17.638	4.902	5.453	6.122	4.528	.551	24	M27	41	1.188	1.156	922
460	18.110	+0 -.0038	14.173 14.961			973 632 1106 400	30.31	21.535	18.425	5.000	5.551	6.220	4.528	.551	28	M27	41	1.188	1.156	922
480	18.898		14.961 15.748		.490	1132 216 1268 672	31.50	22.835	19.213	5.433	5.984	6.654	5.039	.551	30	M27	41	1.188	1.156	922
500	19.685		15.748 16.535	.0048		1200 800 1430 944	33.46	23.622	20.000	5.433	5.984	6.654	5.039	.551	32	M217	41	1.188	1.156	922

\* Stainless steel available upon request.



# Ringfeder® Shrink Disc® RfN 4171

This new RfN 4171 Shrink Disc® employs a single long shallow taper instead of opposing tapers of the traditional Ringfeder® three-piece series (RfN 4071). Better centering and concentricity result, making the shrink disc especially suitable for high-speed applications where balance is critical.

Installation is also simplified. When the fasteners are properly torqued, the installer has a visual aid to indicate correct installation; i.e., the inner ring face should be flush with the outer ring face. Always use a torque wrench to properly tighten screws.



## Two-Piece Type 4171 Specifications

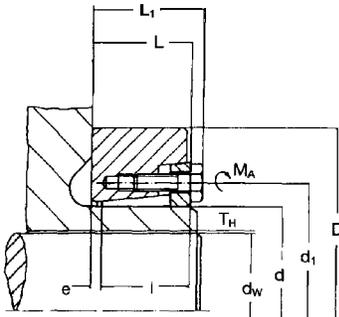


Fig. 74: Installation Dimensions

- d = nominal Shrink Disc® I.D.
  - = hub projection O.D.
  - TH = specified tolerance for hub O.D. (d)
  - dW = shaft size range (min.-max.)
  - TW = total allowable diametrical clearance between shaft and hub bore (dW)
  - Mt = maximum transmissible torque
  - D = Shrink Disc® O.D.
  - d1 = bolt circle dia.
  - L, L1, l, e = width dimensions, relaxed condition
  - MA = required tightening torque per locking screw
  - Pax = axial capacity
- $$= \frac{M_t \times 24}{d_W} \text{ lbs (for } M_t \text{ lb-ft)}$$

Table 13: Two-Piece Shrink Disc® RfN 4171

Material: Alloy Steel

RfN 4171 size	Shaft/Hub dimensions				Mt lb-ft	Shrink Disc® dimensions						Locking Screws DIN 931 - 10.9			
	d	TH inches	shaft range dW	TW		D	L1	L inches	l	e	d1	Qty.	Size	MA lb-ft	Weight lbs
24	0.945	+0 -0.0013	0.748 0.827	.0010	136 180	1.97	0.866	0.709	0.630	0.079	1.417	4	M 6	9	0.4
30	1.181		0.945 1.024		288 353										
36	1.417	↑ +0 -0.0015	1.102 1.220	.0020	483 584	2.83	1.102	0.866	0.787	0.079	2.047	5	M 8	22	1.0
44	1.732		1.339 1.417		535 634										
50	1.969	↑ +0 -0.0018	1.496 1.654	.0020	907 1 180	3.54	1.260	1.024	0.945	0.118	2.677	7	M 8	22	1.7
55	2.165		1.654 1.890		1 124 1 604										
62	2.441	↑ +0 -0.0018	1.890 2.047	.0023	1 315 1 595	4.33	1.378	1.142	1.024	0.118	3.150	8	M 8	22	2.9
68	2.677		1.969 2.362		1 447 2 287										
75	2.953	↓ +0 -0.0021	2.165 2.559	.0023	2 268 3 437	5.43	1.496	1.220	1.063	0.157	3.937	8	M 10	44	4.9
80	3.150		2.362 2.756		2 561 3 754										
90	3.543	↓ +0 -0.0021	2.559 2.953	.0023	3 574 5 112	6.10	1.772	1.496	1.339	0.157	4.488	10	M 10	44	7.3
100	3.937		2.756 3.150		4 595 6 417										

**Table 14: Two-Piece Shrink Disc® RfN 4171**  
Material: Alloy Steel

RfN 4171 size	Shaft/Hub dimensions				M <sub>t</sub> lb ft	Shrink Disc® dimensions						Locking Screws DIN 931 - 10.9			
	d	T <sub>H</sub> inches	shaft range d <sub>w</sub>	T <sub>W</sub>		D	L <sub>1</sub>	L inches	l	e	d <sub>1</sub>	Qty.	Size	M <sub>A</sub> lb ft	Weight lbs
110	4.331	+0 -.0021	3.150 3.543	↑ ↓ .0027	6 594 8 639	7.28	2.244	1.929	1.732	0.197	5.354	10	M 12	74	13.5
125	4.921	↑ ↓ .0025	3.543 3.937		8 925 11 580	8.46	2.402	2.087	1.890	0.236	6.299	12	M 12	74	19.8
140	5.512		4.331	11 359 14 014	9.06	2.638	2.283	2.047	0.236	6.811	10	M 14	118	24.3	
155	6.102	+0 -.0025	4.331 4.724	↑ ↓ .0031	15 490 19 178	10.35	2.795	2.441	2.205	0.236	7.480	12	M 14	118	34.4
165	6.496	4.724 5.118	19 915 23 603		11.42	3.071	2.677	2.402	0.276	8.031	10	M 16	184	48.5	
175	6.890	↑ ↓ .0035	5.118 5.512	27 291 32 454	11.81	3.071	2.677	2.362	0.315	8.425	12	M 16	184	50.7	
185	7.283		5.512 5.906	36 511 43 150	12.99	3.740	3.346	3.031	0.315	8.819	14	M 16	184	79.4	
200	7.784	+0 -.0028	5.906 6.299	↑ ↓ .0040	44 994 52 738	13.78	3.740	3.346	3.031	0.315	9.449	16	M 16	184	88.2
220	8.661	6.299 6.693	72 285 82 611		14.57	4.567	4.055	3.701	0.354	10.630	16	M 20	361	116.9	
240	9.449	↑ ↓ .0035	6.693 7.480	84 824 107 690	15.94	4.724	4.213	3.819	0.394	11.654	18	M 20	361	145.5	
260	10.236		7.480 8.268	118 016 147 520	16.93	5.197	4.685	4.291	0.394	12.521	21	M 20	361	178.6	
280	11.024	+0 -.0032	8.268 9.055	↑ ↓ .0044	143 094 176 286	18.11	5.709	5.197	4.803	0.394	13.386	22	M 20	361	224.9
300	11.811	9.055 9.646	206 528 236 770		19.09	6.102	5.512	5.118	0.394	14.173	20	M 24	620	260.2	
320	12.598	↑ ↓ .0035	9.449 10.236	221 280 263 323	20.47	6.102	5.512	5.118	0.394	14.961	21	M 24	620	302.1	
340	13.386		10.039 10.630	263 323 298 728	22.05	6.693	6.102	5.630	0.472	15.827	22	M 24	620	392.5	
360	14.173	+0 -.0035	11.024 11.811	↑ ↓ .0048	331 920 387 240	23.23	6.850	6.260	5.787	0.472	16.693	24	M 24	620	445.4
380	14.961	11.811 12.402	354 048 396 829		25.00	7.087	6.417	5.866	0.551	17.638	18	M 27	922	765.1	
390	15.354	↑ ↓ .0044	12.205 12.598	371 013 396 829	25.00	7.087	6.417	5.866	0.551	18.031	18	M 27	922	529.2	
400	15.748		12.402 12.795	418 957 446 248	25.59	7.480	6.811	6.260	0.551	18.701	20	M 27	922	575.3	
420	16.535	↑ ↓ .0038	12.795 13.189	442 560 473 539	26.38	7.874	7.205	6.614	0.591	19.488	21	M 27	922	648.3	
440	17.323		12.992 13.780	499 355 569 427	28.35	8.268	7.598	7.008	0.591	20.394	24	M 27	922	811.4	
460	18.110	+0 -.0038	13.780 14.764	↑ ↓ .0048	562 051 638 024	30.31	8.268	7.598	7.008	0.591	21.181	25	M 27	922	948.2
480	18.898	14.764 15.748	678 592 764 154		31.50	9.055	8.386	7.795	0.591	21.969	27	M 27	922	1133.4	
500	19.685	↓	15.748 16.535	775 955 861 517	33.46	9.055	8.386	7.795	0.591	22.835	28	M 27	922	1301.0	

Light Duty and Heavy Duty available upon request.



# RfC Low Inertia Series Shrink Discs® Sizes 10 to 50

These low inertia units are designed for applications where maximum clamping is needed and minimum weight is desired. These Shrink Discs® offer the flexibility of the standard RfN 4071 units for smaller shaft sizes. Available for shafts from 1/4 to 1-11/16 inches. Special sizes and material on request.

## Low Inertia Series Shrink Discs® Specifications

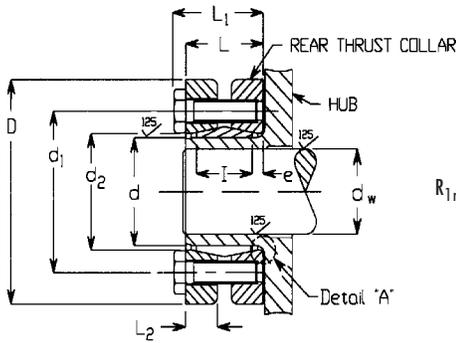


Fig. 75: Low Inertia Shrink Disc®

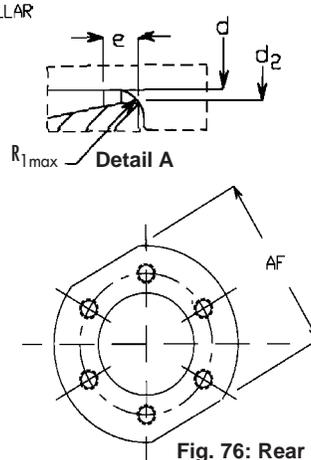


Fig. 76: Rear Thrust Collar

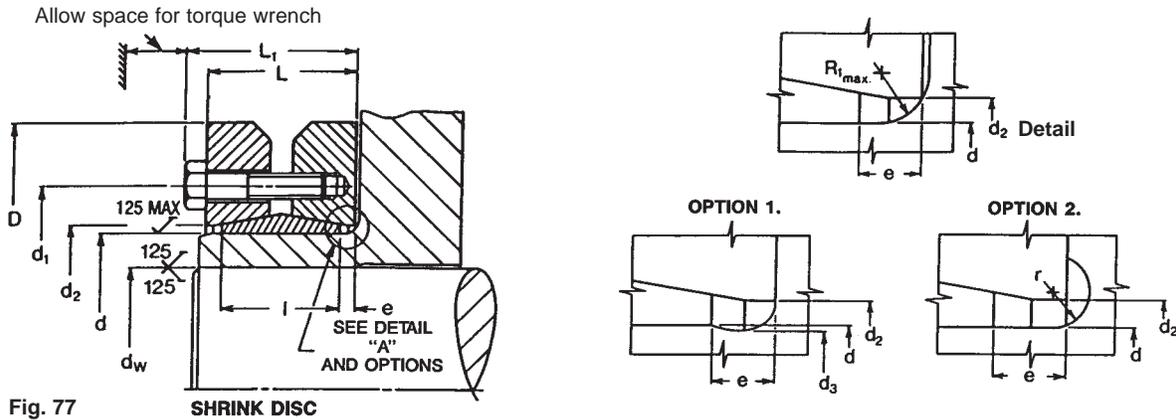
- d = nominal Shrink Disc® I.D.
- = hub projection O.D.
- $T_H$  = specified tolerance for hub O.D. (d)
- $d_W$  = nominal shaft and bore dimension
- $T_W$  = total allowable diametrical clearance between shaft and hub bore ( $d_W$ )
- $M_t$  = maximum transmissible torque
- D = Shrink Disc® O.D.
- $d_1$  = bolt circle dia.
- $d_2$  = thrust ring I.D.
- $L, L_1, e$  = width dimensions, relaxed condition
- $L_2$  = thickness of thrust ring
- AF = distance across flats
- $M_A$  = required tightening torque per locking screw
- s = head dimension across flats (mm)

**Table 15: RfC Low Inertia Series RfC 4051**  
Material: Alloy Steel\*

Size	Shaft/Hub dimensions					$R_1$ max.	Shrink Disc® dimensions										Locking Screws DIN 933 - 10.9 HHCS				
	d inches	$T_H$	mm	$d_W$ inches	$T_W$		$M_t$ lb-in	D	$d_1$	$d_2$	I inches	L	$L_1$	$L_2$	e	AF	Qty.	Size	s mm	$M_A$ lb-in	
10 RfC 4073	0.394		6	.236	0.0005		36	1.18	0.866	0.472	0.394	.472	.582	0.197	0.039	1.06	4	M4x10	7	12	
13 RfC 4073	0.512	+0 -0.001	6.35	.250	0.0007	200	1.30	0.985	0.591	0.394	.472	.610	0.197	0.039	1.25	4	M5x10	8	25		
			9	.354			250	1.50	1.102	0.709	0.394	.551	.689	0.217	0.079	1.44	4	M5x12	8	25	
			8	.315			410														
16 RfC 4051	0.630		12	.472	0.0007	460	1.50	1.102	0.709	0.394	.551	.689	0.217	0.079	1.44	4	M5x12	8	25		
			12.7	.500																554	
			14	.551																730	
24 RfC 4051	0.945	+0	16	.630	0.0007	980	1.875	1.417	1.024	0.394	.610	.748	0.236	0.108	1.75	6	M5x14	8	30		
			19	.748																1 500	
			20	.787																1 750	
30 RfC 4051	1.181	-0.0013	22.2	.875	0.065	1 900	2.10	1.732	1.260	0.472	.689	.827	0.276	0.108	2.05	7	M5x16	8	30		
			24	.945																2 300	
			26	1.024																2 800	
36 RfC 4051	1.417		27	1.063	0.0010	3 500	2.50	2.047	1.496	0.551	.768	.925	0.315	0.108	2.44	5	M6x18	10	75		
			28	1.102																4 130	
			28.6	1.125																4 365	
44 RfC 4051	1.732	+0 -0.0015	34	1.339	0.0013	5 400	2.85	2.402	1.850	0.630	.847	1.000	0.354	0.108	2.75	6	M6x20	10	75		
			34.93	1.375																5 900	
			37	1.457																6 900	
50 RfC 4051	1.969		38	1.496	0.0013	6 400	3.19	2.756	2.087	0.709	.925	1.083	0.394	0.108	3.00	6	M6x20	10	75		
			41.28	1.625																8 000	
			42.85	1.687																9 000	

\* Stainless steel available upon request.  
Larger sizes are available upon request.

# Heavy Duty Shrink Disc® 4091: Small Sizes



d = nominal Shrink Disc® I.D.  
 = hub projection O.D.  
 $T_H$  = specified tolerance for hub O.D. (d)  
 $d_W$  = shaft size range (min.-max.)  
 $T_W$  = total allowable diametrical clearance  
 between shaft and hub bore ( $d_W$ )  
 $M_t$  = maximum transmissible torque  
 D = Shrink Disc® O.D.

$d_1$  = bolt circle dia.  
 $d_2$  = thrust ring I.D.  
 $L, L_1, e$  = width dimensions, relaxed condition  
 $s$  = head dimension across flats (mm)  
 $M_A$  = required tightening torque per locking screw  
 $d_3$  =  $0.98 \times d$  (for OPTION 1)  
 $r$  = to be selected by customer (for OPTION 2)  
 $P_{ax}$  =  $\frac{M_t \times 24}{d_w}$  lbs (for  $M_t$  in lb-ft)

**Table 16: Heavy Duty Shrink Disc® RfN 4091**  
 Material: Alloy Steel\*

RfC 4091 Size	Shaft/Hub dimensions					$M_t$ lb-ft	Shrink Disc® dimensions							Locking screws DIN 931 - 10.9			
	d	$T_H$	inches		$T_W$		$R_{1max.}$	D	$d_1$	$d_2$	inches		L	$L_1$	e	Qty	Size
40	1.575	↑	1.18	↑	0.0016	↑	3.15	2.441	1.730	0.984	1.260	1.477	0.14	4	M8x30	13	22
44	1.732		1.34				1.254	3.35	2.598	1.890	1.102	1.339	1.556	0.10	5	M8x30	13
50	1.969	↑	1.50	↑	0.0019	↑	3.74	2.874	2.126	1.181	1.535	1.752	0.18	7	M8x35	13	22
55	2.165		1.65				2.070	4.13	3.071	2.323	1.181	1.535	1.752	0.18	7	M8x35	13
62	2.441	↑	1.89	↑	0.105	↑	4.53	3.346	2.598	1.181	1.535	1.752	0.18	7	M8x35	13	22
68	2.677		2.05				2.655	4.72	3.622	2.835	1.181	1.535	1.752	0.18	8	M8x35	13
75	2.953	↑	2.36	↑	0.145	↑	5.71	4.134	3.307	1.417	1.811	2.086	0.20	7	M10x40	17	44
80	3.150		2.56				3.835	5.71	4.134	3.307	1.417	1.811	2.086	0.20	7	M10x40	17
90	3.543	↑	2.95	↑	0.165	↑	6.30	4.567	3.701	1.575	1.969	2.244	0.20	8	M10x40	17	44
100	3.937		3.15				7.081	6.69	4.961	4.094	1.732	2.126	2.401	0.20	10	M10x45	17
110	4.331	↑	3.35	↑	0.185	↑	7.28	5.433	4.488	1.969	2.362	2.637	0.20	12	M10x45	17	44
			3.15				10.842										

\* Stainless steel available upon request.



# Ringfeder® Locking Elements™ RfN 8006/GSA

For many years Ringfeder® Locking Elements™ have been used successfully in numerous installations and applications in all fields of mechanical engineering, especially with smaller shaft diameters and for lower torque requirements. By varying clamp force, the number of Locking Elements™ and their arrangement, different configurations can be accommodated.

GSA Locking Elements™ are ideal for fastening gears, pulleys, sprockets, cams, etc., to shafts 1/4" to 3" diameter in data processing equipment, computer peripherals, copiers, and other applications where timing and backlash-free connections are required.

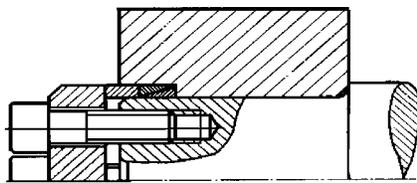


RfN 8006

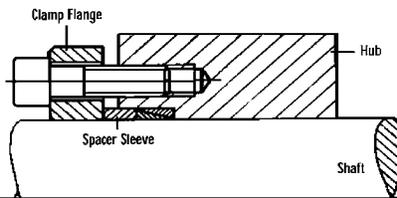


Type GSA

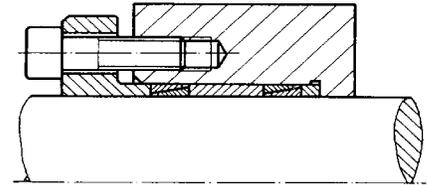
## Design Examples



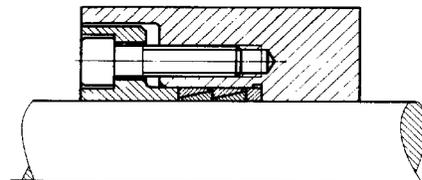
**Fig. 79**  
Shaft-bolted clamp flange (hub axially fixed).



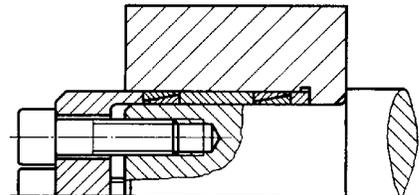
**Fig. 78**  
Hub-bolted clamp flange (hub axially adjustable)



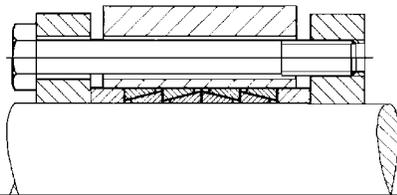
**Fig. 80**  
Hub-bolted Locking Element™ connection. A spacer sleeve between the locking elements provides wider support.



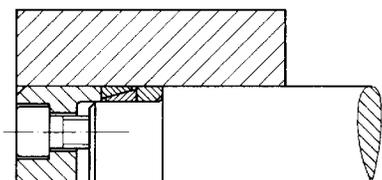
**Fig. 81**  
Hub-bolted Locking Element™ connection. The hub is mounted with two RfN 8006 locking elements in series. The clamp ring is accommodated in the recessed hub.



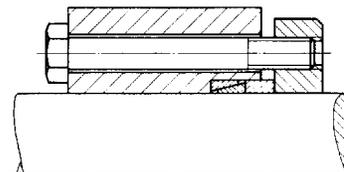
**Fig. 83**  
Shaft-bolted Locking Element™ connection. The hub is mounted using two RfN 8006 Locking Elements™.



**Fig. 82**  
Hub-bolted Locking Element™ connection, double clamped. Here, four RfN 8006 Locking Elements™ can transmit approximately 300%.



**Fig. 84**  
Shaft-bolted Locking Element™ connection. The hub is mounted with one RfN 8006 Locking Element™.



**Fig. 85**  
Hub-bolted Locking Element™ connection. The hub is mounted with one RfN 8006 Locking Element™. Here, the locking screws can be tightened from the left or the right.

*Note: Slit and solid Locking Elements™ are available. Slit elements can be expanded or contracted from the nearest listed metric size to accommodate many common inch-size shafts.*

Solid elements must be used with metric shaft sizes and are generally applied when frequent locking and releasing is required.

- Determine the shaft diameter (d) to be used or the maximum transmissible torque ( $M_t$ ):

$$\text{Torque } M_t = \frac{5252 \times \text{HP}}{\text{RPM}} \quad (\text{lb-ft})$$

If combined torsional and axial loads are to be transmitted, calculate the torque as follows:

$$M_{t \text{ res}} = \sqrt{M_t^2 + \left( \frac{P_{ax} \times d}{24} \right)^2} \leq M_{t \text{ cat}}$$

$M_{t \text{ res}}$  = resultant torque to be transmitted (lb-ft)

$M_t$  = actual or maximum torque to be transmitted (lb-ft)

$P_{ax}$  = axial load-thrust to be transmitted (lbs)

d = shaft diameter (inches)

$M_{t \text{ cat}}$  = max. transmissible torque of Locking Element™ as specified in catalog (lb-ft)

- Select a Locking Element™ for the shaft diameter (d) from the specification tables and verify that the corresponding maximum transmissible torque ( $M_t$ ) meets the torque requirements.

*Note: Required peak torque should never exceed specified transmissible torque ( $M_t$ ).*

Catalog values for ( $M_t$ ) are based on a contact pressure of 14,220 lbs/sq.in (10 kp/mm<sup>2</sup>) between the shaft and the Locking Element™ in a lightly oiled installation.

Higher torque capacities can be obtained by increasing the locking force or using 2 or more Locking Elements™ in series.

*Note: When 2 or more Locking Elements™ are used in series, the following transmissible torque capacities are achieved:*

$$2 \text{ locking elements: } M_{t2} = M_{t1} \times 1.555$$

$$3 \text{ locking elements: } M_{t3} = M_{t1} \times 1.86$$

$$4 \text{ locking elements: } M_{t4} = M_{t1} \times 2.03$$

- Determine the required locking force ( $P_A'$ ) from the specification tables on page 36.

*Note: For slit Locking Elements™, ( $P_A'$ ) is the actual locking force required to generate a contact pressure of 14,220 lbs/sq.in.*

For solid Locking Elements™, in addition to ( $P_A'$ ), a preload ( $P_O$ ) is required to bridge the clearance for the specified fit. The required total locking force for solid Locking Elements™ is:

$$P_A = P_O + P_A'$$

(see the specification tables on page 36).

The locking force is normally obtained by using multiple locking screws and a clamp ring or flange.

- Determine the number, size and grade of screws to be used based on the required locking force and individual screw clamp load (see Table 17).

$$\text{Clamp load/screw} = \frac{\text{required locking force } (P_A) \text{ or } P_A'}{\text{number of screws } (z)}$$

- Determine the size of clamp ring or flange using the following empirical equations:

- Bolt circle diameter (dH, dS):

$$dH = D + 0.375 + d_b \text{ (inches)}$$

$$dS = d - 0.375 - d_b \text{ (inches)}$$

- Thickness of clamp ring or flange (SF):

$$SF \geq 1.5 \times d_b \text{ for screw Grade 2 and 5}$$

$$SF \geq 2.0 \times d_b \text{ for screws Grade 8}$$

Flange material: steel with YP  $\geq$  45,000 lbs/sq.in

- Recommended clearance "x" and maximum values for R are shown in the specification tables on page 36.

- Calculate the hub outside diameter ( $D_N$ ) using the following formula:

$$D_N \geq D \times \sqrt{\frac{Y_p + 0.8 \times p'}{Y_p - 0.8 \times p'}} + d_b$$

Where:  $Y_p$  = yield point of hub material (lbs/sq.in)

$p'$  =  $p \times d/D$  (lbs/sq.in) (see page 36)

$B \geq 2 \times l$  (inches) (see Fig. 88: Tightening Sequence)

$d_b$  = bolt dia. (inches)

In applications where the locking screws are seated in the shaft, delete  $d_b$  and replace 0.8 by 0.6.

See Ordering Example on page 36.

*Note: Slit Locking Elements™ have a slit approx. 0.040" wide. If the selected Locking Element™ must be opened up or contracted to place it over a larger or smaller shaft, respectively, the hub bore must be increased or decreased by the same amount in order to maintain the specified space between the hub bore and shaft (D-d). Note the following examples:*

*To open up an element to 0.016" (e.g. 25 x 30 Rfn 8006/Slit) for a 1" shaft, the calculations are as follows:*

$$\text{shaft: } 0.984" + 0.016" = 1.000"$$

$$\text{hub bore: } 1.181" + 0.016" = 1.197"$$

*To contract an element to 0.0155" (e.g. 75 x 84 Rfn 8006/Slit) for a 2-15/16" shaft, the calculations are as follows:*

$$\text{shaft: } 2.9530" - 0.0155" = 2.9375"$$

$$\text{hub bore: } 3.3070" - 0.0155" = 3.2915"$$

**Table 17: Clamp Load – UN Fasteners**

Bolt Size	CLAMP LOAD TABLE					
	S.A.E. Grade 2		S.A.E. Grade 5		S.A.E. Grade 8	
	Load* (lbs)	Torque (lb-in)	Load* (lbs)	Torque (lb-in)	Load* (lbs)	Torque (lb-in)
4 - 40	250	5	380	8	540	12
4 - 48	275	6	420	9	600	13
6 - 32	375	10	580	16	820	23
6 - 40	420	12	640	18	920	25
8 - 32	580	19	900	30	1 260	41
8 - 36	610	20	940	31	1 320	43
10 - 24	725	27	1 120	43	1 580	60
10 - 32	825	31	1 285	49	1 800	68
	(lbs)	(lb-ft)	(lbs)	(lb-ft)	(lbs)	(lb-ft)
1/4 - 20	1 300	5	2 000	8	2 850	12
1/4 - 28	1 500	6	2 300	10	3 250	14
5/16 - 18	2 150	11	3 350	17	4 700	24
5/16 - 24	2 400	13	3 700	19	5 200	27
3/8 - 16	3 200	20	4 950	30	6 950	45
3/8 - 24	3 600	22	5 600	35	7 900	50
7/16 - 14	4 400	30	6 800	50	9 600	70
7/16 - 20	4 900	35	7 550	55	10 700	80
1/2 - 13	5 850	50	9 050	75	12 800	105
1/2 - 20	6 550	55	10 200	85	14 400	120
9/16 - 12	7 550	70	11 600	110	16 400	115
9/16 - 18	8 350	80	13 000	120	18 300	170

\* Clamp load (lbs) is equal to 75% of bolt proof load.  
(Courtesy of Modulus Industrial Fasteners).

# Locking Elements™ RfN 8006 Specifications

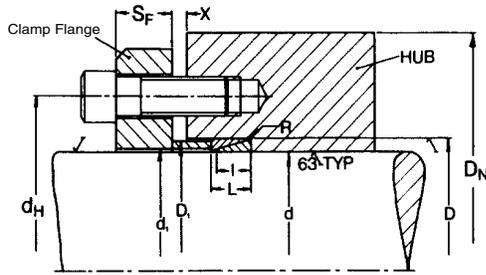


Fig. 86: Hub bolted design

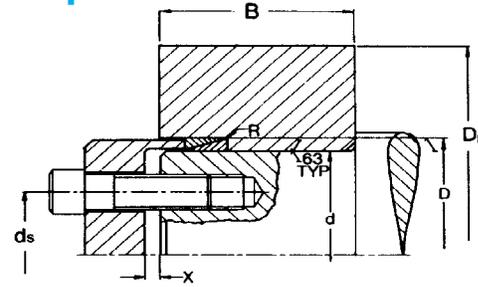


Fig. 87: Shaft bolted design

- $d$  = nominal inner ring I.D.  
 = shaft O.D.  
 $T_1$  = machining tolerances for shaft ( $d$ )  
 $T_b$  = machining tolerances for hub bore ( $d$ )  
 $D$  = nominal outer ring O.D.  
 = hub counter bore I.D.  
 $T_2$  = machining tolerances for hub counter bore ( $D$ )  
 $L, l$  = width dimensions, relaxed condition  
 $P_O$  = preload to bridge specified fit clearances  
 $P_A$  = actual locking force to generate  $p = 14,220$  lbs/sq.in  
 $M_t$  = transmissible torque of one locking element  
 $p$  = contact pressure between inner ring and shaft  
 $x$  = recommended clearance between clamp flange and hub or shaft  
 $R$  = radius in hub outer bore  
 $d_1$  = spacer sleeve I.D.

- $T_3$  = tolerances for spacer sleeve I.D. and O.D.  
 $D_1$  = spacer sleeve O.D.  
 $P_{ax}$  = axial load capacity  

$$= \frac{M_t \times 24 \text{ lbs}}{d}$$
 (for  $M_t$  in lb-ft)

Note: Values for ( $M_t$ ) are based on a contact pressure of 14,220 psi (10 kp/mm<sup>2</sup>) between the shaft and Locking Element™ in a lightly oiled installation and a coefficient of friction of  $\mu = 0.12$ .

### Ordering Example

	Size	RfN	Series-Type
Solid:	25 x 30	RfN	8006/ SOLID
Slit:	25 x 30	RfN	8006/ SLIT

**Table 18: Locking Elements™ RfN 8006**  
Material: Special Spring Steel\*

RfN 8006 Size d x D mm	Locking Element™ dimensions inches							$P_O$ lbs	$P_A$ lbs	$M_t$ (based on $p=14220$ psi) lb-ft	$X$ Elements inches			$R$ inches	Spacer sleeve inches		
	$d$	$T_1$	$T_b$	$D$	$T_2$	$L$	$l$				1	2	3		$d_1$	$T_3$	$D_1$
6 x 9	.236			.354	-0	.177	.146	—	713	1.56	.08	.08	.12	.004	.240		.350
7 x 10	.276	+0	-0	.394	+0.0006	.177	.146	—	832	2.13	.08	.08	.12	.004	.280		.390
8 x 11	.315	-0.0004	+0.0006	.433		.177	.146	—	946	2.78	.08	.08	.12	.004	.319		.429
9 x 12	.354			.473		.177	.146	1 672	1 254	4.12	.08	.08	.12	.004	.358		.468
10 x 13	.394			.512	-0	.177	.146	1 529	1 386	5.06	.08	.08	.12	.004	.398		.508
12 x 15	.473			.591	+0.0007	.177	.146	1 529	1 650	7.23	.08	.08	.12	.004	.476		.586
13 x 16	.512			.630		.177	.146	1 419	1 793	8.53	.08	.08	.12	.004	.516		.626
14 x 18	.551	+0	-0	.709		.248	.209	2 464	2 772	14.18	.12	.12	.16	.004	.555		.705
15 x 19	.591	-0.0004	+0.0007	.748		.248	.209	2 365	2 970	16.27	.12	.12	.16	.004	.594		.744
16 x 20	.630			.787		.248	.209	2 222	3 168	18.44	.12	.12	.16	.004	.634		.783
17 x 21	.669			.827	-0	.248	.209	2 101	3 366	20.90	.12	.12	.16	.004	.673		.823
18 x 22	.709			.866	+0.0008	.248	.209	2 002	3 564	23.43	.12	.12	.16	.004	.712		.862
19 x 24	.748			.945		.248	.209	2 772	3 762	26.04	.12	.12	.16	.004	.756		.937
20 x 25	.787	+0	-0	.984		.248	.209	2 561	3 960	28.93	.12	.12	.16	.004	.795		.976
22 x 26	.866	-0.0005	+0.0008	1.024		.248	.209	1 991	4 356	34.72	.12	.12	.16	.004	.874		1.015
24 x 28	.945			1.102		.248	.209	1 837	4 752	41.95	.12	.12	.16	.004	.952		1.094
25 x 30	.984	+0	-0	1.181		.248	.209	2 178	4 950	44.84	.12	.12	.16	.004	.992		1.173
28 x 32	1.102	-0.0005	+0.0008	1.260		.248	.209	1 628	5 544	56.42	.12	.12	.16	.004	1.110		1.252
30 x 35	1.181			1.378		.248	.209	1 870	5 940	65.10	.12	.12	.16	.004	1.189		1.370
32 x 36	1.260			1.417	-0	.248	.209	1 727	6 336	73.78	.12	.12	.16	.004	1.268		1.409
35 x 40	1.378			1.575	+0.001	.276	.236	2 222	7 832	99.82	.12	.12	.16	.004	1.386		1.567
36 x 42	1.417			1.654		.276	.236	2 552	8 052	106.33	.12	.12	.16	.004	1.425		1.645
38 x 44	1.4986	+0	-0	1.732		.276	.236	2 420	8 514	117.90	.12	.12	.16	.004	1.504		1.724
40 x 45	1.575	-0.0006	+0.001	1.772		.315	.260	3 036	9 900	143.94	.12	.16	.20	.004	1.583		1.764
42 x 48	1.654			1.890		.315	.260	3 432	10 340	158.40	.12	.16	.20	.004	1.661		1.882
45 x 52	1.772			2.047		.394	.339	6 204	14 520	237.24	.12	.16	.20	.008	1.779		2.039
48 x 55	1.890			2.165		.394	.339	5 412	15 400	269.79	.12	.16	.20	.008	1.897		2.157
50 x 57	1.969			2.244		.394	.339	5 170	16 060	292.94	.12	.16	.20	.008	1.976		2.236
55 x 62	2.165			2.441	-0	.394	.339	4 796	17 600	354.42	.12	.16	.20	.008	2.173		2.433
56 x 64	2.205	+0	-0	2.520	+0.0018	.472	.409	6 468	21 780	444.83	.12	.16	.20	.008	2.212		2.512
60 x 68	2.362			2.677		.472	.409	6 028	23 320	509.93	.12	.16	.20	.008	2.370		2.669
63 x 71	2.480	+0	-0	2.795		.472	.409	5 786	24 420	564.17	.12	.16	.20	.008	2.488		2.787
65 x 73	2.559	-0.0018	+0.0018	2.874		.472	.409	5 580	25 300	600.34	.12	.16	.20	.008	2.567		2.866
70 x 79	2.756			3.110		.551	.480	6 820	31 900	810.10	.12	.20	.24	.012	2.768		3.098
71 x 80	2.795			3.150	-0	.551	.480	6 820	32 340	839.03	.12	.20	.24	.012	2.807		3.137
75 x 84	2.953			3.307	+0.0022	.551	.480	7 612	34 100	933.06	.12	.20	.24	.012	2.964		3.295
80 x 91	3.150			3.583		.669	.591	10 560	44 660	1 309.17	.16	.20	.24	.012	3.161		3.570
85 x 96	3.346	+0	-0	3.780		.669	.591	10 032	47 520	1 475.53	.16	.20	.24	.012	3.358		3.767
90 x 101	3.543	-0.0022	+0.0022	3.976		.669	.591	9 548	50 380	1 656.36	.16	.20	.24	.012	3.555		3.964
95 x 106	3.740			4.173		.827	.736	9 064	53 240	1 844.42	.16	.20	.24	.012	3.752		4.161
100 x 114	3.937	+0	-0	4.488		.827	.736	13 354	69 740	2 546.02	.16	.24	.28	.016	3.949		4.476
110 x 124	4.331			4.882		.827	.736	14 520	76 780	3 074.03	.16	.24	.28	.016	4.342		4.870
120 x 134	4.724			5.276	-0	.827	.736	13 244	83 600	3 652.67	.16	.24	.28	.016	4.736		5.263
130 x 148	5.118	+0	-0	5.827	+0.0025	1.102	.996	21 164	122 760	5 822.57	.20	.28	.35	.016	5.134		5.811
140 x 158	5.512			6.220		1.102	.996	19 580	132 000	6 762.86	.20	.28	.35	.016	5.527		6.204
150 x 168	5.906	-0.0025	+0.0025	6.614		1.102	.996	18 590	141 460	7 739.31	.20	.28	.35	.016	5.921		6.598

\* Stainless steel available upon request.

For larger sizes up to shaft diameters of 1000 mm (39.37"), see Catalog S86A.

**Mounting** — There are two basic methods for mounting the clamp plate:

1. Hub bolting permits axial positioning of the hub as well as angular adjustment.
2. Shaft bolting requires the hub to be backed against a shoulder to support the clamping force. This method does not allow axial adjustment.

**Bolt Circle Diameter ( $d_H$  or  $d_S$ )** — This method permits the locking screws to be as close as possible to the Locking Elements™.

*Note: If a single locking screw or nut is located in the center of the shaft it must be secured to prevent loosening.*

**Thickness ( $S_F$ )** — Thickness must be sufficient to prevent excessive deflection under the required locking force. Deflection will reduce the induced axial locking force on the elements and may cause the plate to bottom out on the hub or shaft face.

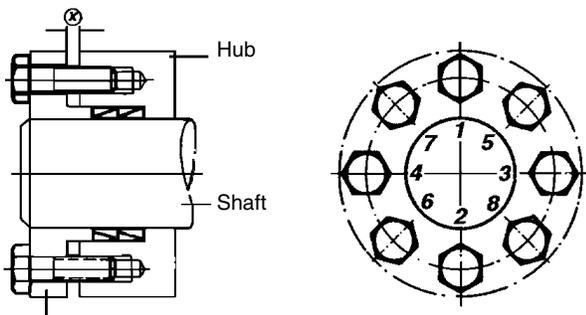
**Clearance** — Under full applied force, there must be an axial clearance between the clamp plate and hub or shaft face to prevent bottoming out. A spacer sleeve may be necessary. The sleeve outer diameter must be smaller than the hub counter bore by approx. 0.005", and its inner diameter must be larger than the shaft diameter by the same amount to assure a clearance fit.

**Hub Outside Diameter ( $D_N$ )** — The outside diameter of the hub must be sized to accommodate radial contact pressures.

## Installation and Removal Instructions

Since the torque is transmitted by contact pressure and friction between the frictional surfaces, the condition of the contact surfaces and the proper tightening of the locking screws are important.

### INSTALLATION



**Fig. 88: Tightening Sequence**  
Tightening sequence for locking screws.

1. Carefully clean and lightly oil the shaft, hub bore, spacer sleeves and Locking Elements™.

*Note: Do NOT use a Molybdenum Disulphide LUBRICANT ("MOLYKOTE" OR THE LIKE).*

2. Install the parts in the following order:
  - a) Hub (the play between hub bore and shaft affects the true running of the hub).
  - b) Spacer sleeve to bridge the undercut (if needed)
  - c) Outer ring/inner ring (both parts must slide on easily). For one Locking Element™ install the outer ring first. Otherwise, install the inner ring first.

- d) Spacer sleeve and clamp flange or clamp ring (both parts should slide on easily).
- e) Carefully oil the locking screw threads and head bearing surfaces.

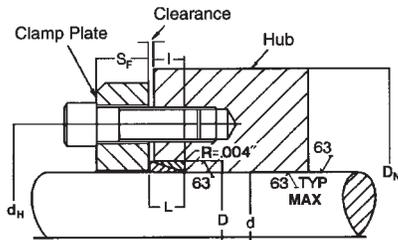
*Note: Do NOT use Molybdenum Disulphide.*

3. Tighten the locking screws evenly and in several steps following the diametrically opposite sequence illustrated in Fig. 88.
  - a) Tighten the screws by hand until a slight positive contact is established. Make final alignment adjustments to the connection.
  - b) Tighten the screws to approx. one-half the specified torque using an extended key or torque wrench.
  - c) Tighten the screws to full tightening torque using a torque wrench.
  - d) Verify that the screws are fully tightened by applying the specified torque.
4. Check distance x. The clamp ring should not make contact with the face of the hub. The gap between the clamp ring and hub face should be even all the way around.

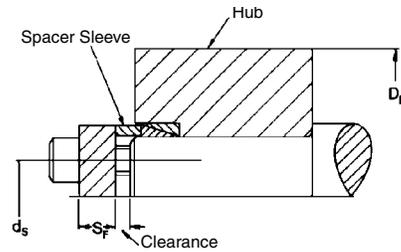
### REMOVAL

*Note: Ringfeder® Locking Elements™ are not self-locking.*

1. Remove any accumulated contaminants from the connection.
2. Loosen the locking screws in several stages following a diametrically opposite sequence.
3. Reduce the hub and Locking Elements™ from the shaft. If the Locking Element™ is jammed, loosen it by tapping it with a light hammer.



**Fig. 89: Hub bolted Clamp Plate**  
(hub axially adjustable)



**Fig. 90: Shaft bolted Clamp Plate**  
(hub axially fixed)

$d$  = shaft diameter  
 $T_1$  = machining tolerances for shaft ( $d$ )  
 $D$  = counter bore diameter  
 $T_2$  = machining tolerances for counter bore ( $D$ )  
 $L, I$  = width dimensions, relaxed condition  
 $R$  = radius in hub bore  
 $P_O$  = preload to bridge specified fit clearances  
 $P_A$  = actual locking force to generate  $M_t$

$M_t$  = transmissible torque for one Locking Element™ based on coefficient of friction of  $\mu = 0.15$  and 10,000 psi contact pressure (torque can be increased by up to 50%)  
 $P_{ax}$  = axial load (thrust capacity)  

$$= \frac{M_t \times 24 \text{ lbs}}{d_w} \text{ (for } M_t \text{ lb-ft)}$$

## Selection Guide

- Determine the shaft diameter to be used and the maximum torque ( $T$ ) to be transmitted.

$$T = \frac{63,000 \times \text{HP}}{\text{RPM}} \text{ (inch-lbs)}$$

- Select a locking element from the specification table for the shaft diameter. Verify that the transmissible torque ( $M_t$ ) for the element meets the torque requirement.

*Note: Required peak torque should never exceed specified transmissible torque ( $M_t$ ). Higher torque capacities can be obtained by increasing the locking force.*

- Determine the required locking force ( $P_A'$ ) from Table 19. A preload ( $P_O$ ) is required to bridge the clearance for the specified fits. The total required locking force is  $P_A = P_O + P_A'$ .

The locking force is normally obtained by using one or more screws and a clamp plate (see Fig. 80 and Fig. 81).

- Refer to Table 16: Clamp Load on page 33 to determine the number, size and grade of screws needed for the required locking force and individual screw clamp load.

$$\text{Clamp load/screw} = \frac{\text{required locking force } (P_A) \text{ of } P_A'}{\text{number of screws } (z)}$$

**Table 19: Locking Elements™ Type GSA**

Material: Aluminum Alloy\*

Size	GSA Locking Element™ dimensions						$P_O$ lbs	$P_A'$ lbs	$M_t$ lb-in	Wt. lbs per 1000
	$d$	$T_1$	$D$ inches	$T_2$	$L$	$I$				
GSA-250	.250		.375		.126	.094	580	450	14	.76
GSA-312	.3125		.4375	-0	.143	.112	686	670	26	1.04
GSA-375	.375	-.0005	.500	+0.0005	.160	.128	673	920	43	1.35
GSA-437	.4375		.5937		.176	.143	796	1 196	65	2.20
GSA-500	.500		.6562		.193	.158	944	1 512	94	2.69
*GSA-562	.5625		.750	-0 +0.001	.210	.174	1 259	1 872	132	3.97
GSA-625	.625		.8125		.226	.187	1 231	2 237	175	4.69
*GSA-687	.6875		.875		.243	.203	1 414	2 670	230	5.47
GSA-750	.750		.9375		.260	.219	1 413	3 145	295	6.33
GSA-812	.8125	-.001	1.0312		.276	.234	1 617	3 637	370	8.56
GSA-875	.875		1.0937	-0	.293	.250	1 611	4 188	458	10.14
*GSA-937	.9375		1.1875	+0.0015	.310	.267	2 087	4 790	561	12.36
GSA-1000	1.000		1.250		.326	.284	2 090	5 437	680	14.05
GSA-1125	1.125	+0	1.406		.359	.312	2 220	6 620	840	19.55
GSA-1250	1.250	-.0015	1.531		.393	.344	2 240	8 105	1 140	23.54
GSA-1375	1.375		1.687		.426	.376	2 745	9 750	1 510	31.22
GSA-1500	1.500		1.812		.459	.407	3 030	11 510	1 940	36.38
GSA-1625	1.625	+0 -.002	1.968	-0 +0.002	.492	.437	3 295	13 390	2 450	46.43
GSA-1750	1.750		2.125		.526	.469	3 585	15 475	3 045	58.53
GSA-1875	1.875		2.250		.559	.500	3 595	17 675	3 730	66.22
*GSA-2000	2.000		2.406		.592	.528	5 365	19 910	4 480	81.09
*GSA-2250	2.250		2.656		.592	.528	4 795	22 400	5 670	90.30
GSA-2437	2.437	+0	2.843	-0	.592	.528	4 430	24 260	6 655	97.07
*GSA-2500	2.500	-.003	2.906	+0.003	.592	.528	4 330	24 885	7 000	99.50
GSA-2687	2.687		3.093		.592	.528	4 035	26 750	8 090	106.26
*GSA-2750	2.750		3.156		.592	.528	3 950	27 370	8 470	108.70
*GSA-3000	3.000		3.406		.592	.528	3 890	29 860	10 080	117.90

\* Stainless steel available upon request.

\* Delivery on request; other sizes stocked. Contact Ringfeder Corporation for additional sizes and information.

# Torque Wrenches



Torque wrenches are an integral part of the proper installation of all Ringfeder® locking devices. We, therefore, offer a low profile head torque wrench specifically suited to our products.

For controlled tightening of locking screws of Locking Assemblies™ RINGFEDER®, we offer suitable torque wrenches and attachments. These tools facilitate the installation of our Locking Assemblies™ RfN 7012 particularly on straight through shafts. They can be used, of course, also for mounting of Locking Assemblies™ RINGFEDER® RfN 7013, 7014, 7015, Locking Elements™ RINGFEDER® RfN 8006 and Shrink Discs® RfN 4071, RfN 4051 and RfN 4091.

The rigid square drives SD and hex bit sockets exhibit compact over-all dimensions and can be combined with commercially available extensions. The SD-drives fit with all CCM torque handles. Square drives and hex bit socket drives required for any given Locking Assembly™ size are listed in the following table.

## Description and operation

When preset torque is reached, you hear a click and feel the breakover. No inaccuracies are caused by dials and indicators.

Torque setting is achieved by turning the adjustable micrometer torque handle. Every setting point is felt by a distinct stop.

Torque setting cannot accidentally change while wrench is in use. By turning the lock screw located at the end of the handle counter-clockwise ("Lock"), the adjustable handle is locked. By turning it clockwise ("Unlock"), the handle is unlocked.

Frictionless adjustment mechanism permits high torque accuracy even after prolonged use.

Slim design and light weight for better accessibility to fasteners and minimum operator fatigue.

Required attachments slide easily onto the dovetailed and pin locked torque handle. For release of attachments, the spring-loaded lock pin can be easily depressed by a pin or screw driver.

Various accessories are available upon request. Call our technical department for assistance.



Fig. 91: Square Drives  
1/4", 3/8", 1/2" or 3/4" square drive



Fig. 92

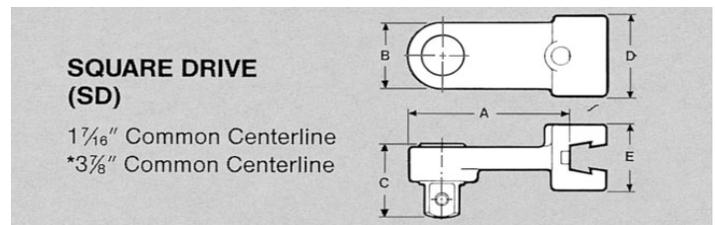


Fig. 93

Table 20: SQUARE DRIVE ENGLISH

PART NUMBER	MODEL NUMBER	DRIVE SIZE	MAX. TORQUE in lbs	A in.	B in.	C in.	D in.	E in.
819057	SD-1/4	1/4	250	1-23/32	9/16	3/4	3/4	11/16
819058	SD-3/8	3/8	1250	1-7/8	7/8	7/8	1-1/8	13/16
819059	SD-1/2	1/2	2500	1-7/8	7/8	1	1-1/8	13/16
819119	SD-3/4*	3/4	4800	4-5/8	1-1/2	1-13/32	1-1/2	1



# Locking Assembly™ & Shrink Disc® Torque Wrench Selection Charts

**Table 21**

LOCKING ASSEMBLY™				TIGHTENING TORQUE PER SCREW		SCREW SIZE (d <sub>s</sub> )	HEX KEY SIZE (s)	SQ DRIVE	TORQUE WRENCH	HYDRAULIC TORQUE WRENCH <sup>1</sup>
RfN 7012 SIZE		RfN 7012-IN SIZE		LB-FT	Nm	mm	mm	IN	MODEL#	MODEL#
FROM	TO	FROM	TO							
20	40	1	1 1/2	10.1	14	M6	5	1/4	CCM 150I	
42	65	1 5/8	2 9/16	25.3	35	M8	6	3/8	CCM 600I	
70	95	2 3/4	3 3/4	50.6	70	M10	8	3/8	CCM 75	
100	160	3 15/16	6	90.4	125	M12	10	3/8	CCM 1200I	
170	200	6 1/2	7 7/8	137.4	190	M14	12	1/2	CCM 150	
220	260			213.4	295	M16	14	3/4	CCM 300	HTM 05
280	300			292.9	405	M18	14	3/4	CCM 300	HTM 05
320	340			419.5	580	M20	17	3/4	6 SD 600	HTM 07
360	420			564.2	780	M22	17	3/4	6 SD 600	HTM 07
440	1000			723.3	1000	M24	19			HTM 10

**Table 22**

LOCKING ASSEMBLY™				TIGHTENING TORQUE PER SCREW		SCREW SIZE (d <sub>s</sub> )	HEX KEY SIZE (s)	SQ DRIVE	TORQUE WRENCH	HYDRAULIC TORQUE WRENCH <sup>1</sup>
RfN 7013.0 / .1 SIZE		RfN 7013.0 / .1-IN SIZE		LB-FT	Nm	mm	mm	IN	MODEL#	MODEL#
FROM	TO	FROM	TO							
20	40	1	1 1/2	12.5	17	M6	5	1/4	CCM 600I	
42	65	1 5/8	2 9/16	30.0	41	M8	6	3/8	CCM 600I	
70	120	2 3/4	4	60.0	83	M10	8	3/8	CCM 75	
130	150			105.0	145	M12	10	1/2	CCM 150	

**Table 23**

SHRINK DISC®						TIGHTENING TORQUE PER SCREW		SCREW SIZE (d <sub>s</sub> )	SOCKET SIZE (s)	SQ DRIVE	TORQUE WRENCH	HYDRAULIC TORQUE WRENCH <sup>1</sup>
RfN 4071 SIZE		RfN 4051 SIZE		RfN 4091 SIZE		LB-FT	Nm	mm	mm	IN	MODEL#	MODEL#
FROM	TO	FROM	TO	FROM	TO							
24	30					3	4	M5	8	1/4	CCM 50I	
36	68					9	12	M6	10	1/4	CCM 150I	
75	100					22	30	M8	13	3/8	CCM 600I	
110	125	125	155			44	59	M10	17	3/8	CCM 600I	
140	155	165	200	125	155	74	100	M12	19	3/8	CCM 1200I	HTM 05
165	220	220	340	165	220	185	250	M16	24	1/2	CCM 300	HTM 10
240	360	350	500	240	320	362	490	M20	30	3/4	CCM 400	HTM 10
380	480			340	420	620	840	M24	36			HTM 10
500	620			440	500	922	1250	M27	41			HTM 10

**Table 24**

LOW INERTIA SERIES SHRINK DISC®					TIGHTENING TORQUE PER SCREW		SCREW SIZE (d <sub>s</sub> )	SOCKET SIZE (s)	SQ DRIVE	TORQUE WRENCH
		FROM	TO		LB-IN	Nm	mm	mm	IN	MODEL#
		10			12	1.4	M4	7	1/4	CCM 50I
		13	16		25	2.8	M5	8	1/4	CCM 50I
		24	30		30	3.4	M5	8	1/4	CCM 50I
		36	50		75	8.5	M6	10	1/4	CCM 150I

**Table 25**

SHRINK DISC® RfN 4171 SIZE		TIGHTENING TORQUE PER SCREW		SCREW SIZE (d <sub>s</sub> )	SOCKET SIZE (s)	SQ DRIVE	TORQUE WRENCH	HYDRAULIC TORQUE WRENCH <sup>1</sup>
FROM	TO	LB-FT	Nm	mm	mm	IN	MODEL#	MODEL#
24	30	9	12	M6	10	1/4	CCM 150I	
36	68	22	30	M8	13	3/8	CCM 600I	
75	100	44	59	M10	17	3/8	CCM 600I	
110	125	74	100	M12	19	3/8	CCM 1200I	HTM 05
140	155	118	160	M14	22	1/2	CCM 150	HTM 05
165	200	184	250	M16	24	1/2	CCM 300	HTM 10
220	280	361	490	M20	30	3/4	CCM 400	HTM 10
300	360	620	840	M24	36			HTM 10
380	500	922	1250	M27	41			HTM 10

Notes:

1. Hydraulic upon request.
2. Call Ringfeder Corp. with your specific requirements and questions at 1-800-245-2580

# The ABC's of the RINGFEDER® Locking Devices



## Adjustability

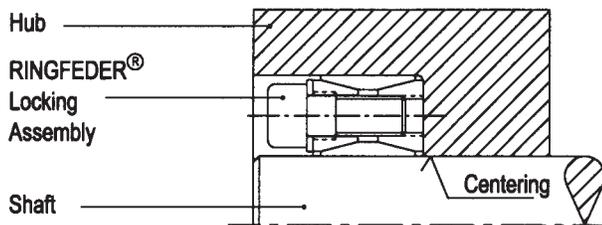
The friction-lock connection by means of locking devices is infinitely variable and can be adjusted with a high degree of accuracy.

## Axial force $F_{ax}$

The axial thrust that can be transmitted by locking devices regardless of the type of load encountered (static, increasing, alternating or impact).  $F_{ax}$  can be calculated by dividing the torque by the shaft radius ( $F_{ax} = 2 \times t/d$ ). In comparison with these theoretical values, substantially higher values have been established in practical operations.

## Centering action

Guiding action of the shaft in the minor bore of the hub. The clearance between shaft and hub bore and the length of the minor bore have the greatest effect on → True running of the mounted hub.



**Fig. 94**  
Locking Assembly™ RINGFEDER® 7012 Connection.  
Principle sketch.

## Clearances

See appropriate tables.

## Coefficient of friction $\mu$

The catalog values apply to  $\mu = 0.12$ . Surfaces of the Locking Devices, shaft and hub bore slightly oiled.

## Contact pressure $p$ , $p'$ (internal devices)

$p$  = contact pressure between inner ring and shaft  
 $p'$  = contact pressure between outer ring and hub  
 $p$  and  $p'$  – together with the → Coefficient of friction  $\mu$  – determine the frictional connection value. In order to avoid deformation in the plastic range, the following values must obtain:

- $p < \text{yield point at shaft}$
- $p' < \text{yield point of hub}$

## Fatigue strength under alternating torsion stresses

The greatest variable stress component oscillating about the mean stress zero that a specimen can resist an unlimited number of times without fracture or inadmissible deformation is Fatigue Strength. This value is influenced by shape and surface finish. The ratio between the fatigue strength of the unnotched and polished specimen and the fatigue strength of the test specimen is referred to as notch factor  $\beta_k$ .

$\beta_k$  varies from material to material and decreases in value as the static tensile strength value increases.

When locking devices are used, both shaft and hub retain their full cross-sections, i.e. are not grooved. Consequently, the stress states at the connection point are virtually identical with those of a smooth shaft, i.e. the material is utilized by almost 100%.

## Fretting / Galling

Damage to or destruction of shaft, hub bore or locking device surfaces as a result of overloading followed by → Slip. Fretting can always be avoided by correct dimensioning of the connection.

## Fretting corrosion

Corrosion between the contact surfaces of ferrous metals. Even the smallest relative movements favour and accelerate fretting corrosion; lubricants can delay the process, but not stop it altogether. Long-term prevention of fretting corrosion can be achieved only by designing the connection in such a way that relative movement is impossible.

## Locking screws – securing of

Screws subjected to static loads need not be secured against slackening (in some cases, lock washers, etc. can even be harmful). The screws used in conjunction with locking devices are normally subjected to static loads only; consequently, they need not be secured against loosening. Tightening down to the specified torque value is quite adequate.

## Molykote

Trade name of a lubricant containing molybdenum disulphide ( $\text{MoS}_2$ ). As  $\text{MoS}_2$  reduces the → Coefficient of friction, it is used for frictional connections between shafts and hubs in exceptional cases only. We urgently recommend that our advice be sought if it is intended that lubricants containing  $\text{MoS}_2$  be used in conjunction with internal locking devices.

Shrink Discs®, however, utilize  $\text{MoS}_2$  greases to lubricate tapers and fasteners to gain the mechanical advantage necessary for their proper function.

## Notch factor $\beta_k$

Fatigue strength under alternating torsion stresses.

## Notch impact strength figure $\eta_k$

Product of the → Shape factor  $\alpha_k$  (governed by material configuration) and the → Notch factor  $\beta_k$  (governed by material properties):

$$\eta_k = \frac{\beta_k - 1}{\alpha_k - 1}$$

Approximate values for  $\eta_k$ :

0,4 ... 0,8 – light metals and C-steels

0,6 ... 1 – heat-treatable steels

## Play, freedom from

Connections with locking devices are absolutely free of play. Like other frictional connections there is no danger of lateral oscillation.

## Polar section modulus $W_p$

In the case of circular cross sections,  $W_p$  is defined thus:

$$W_p = d^3 \times \pi / 16$$

The value of  $W_p$  is significantly reduced by keyways, grooves for Woodruff keys, etc. When using locking devices the full cross-section of the shaft is available (see Shape factor  $\alpha_k$ ).

## Radial load, admissible

Internal locking devices can also absorb radial loads. It must be considered, however, that the surface pressure resulting from the radial load with respect to the projected surface of the Locking Assembly™, is smaller than the surface pressure generated by the clamping.

## Releasability

Locking Assemblies™ RfN 7012 and Locking Elements 8006 are not self-locking. The angle of the tapered rings is such that releasability is guaranteed even after prolonged heavy loading. Extractors are not required.

## Rust

Because of the relatively high pressures per unit of area, rusting cannot take place between the effective surfaces of a locking device as well as shaft and hub. Some locking devices have split inner and outer rings and cannot hermetically seal the clamping point. In this case we advise to use corrosion inhibitors, seals, etc. in order to protect the Locking Assemblies™ (locking screws) against corrosion.

## Safety

The frictional connection values given in the tables are achieved or even exceeded if designing is correct and the connection properly made. The theoretical values are higher. Frictional connections of all types – including shrink fits and press fits – must be designed in such a way that the load peaks can be dependably transmitted. However, the load peaks vary so greatly from case to case that we are unable to give any recommendations as regards specific safety factors.

locking device connections are insensitive to impact loads (see Fig. 95).

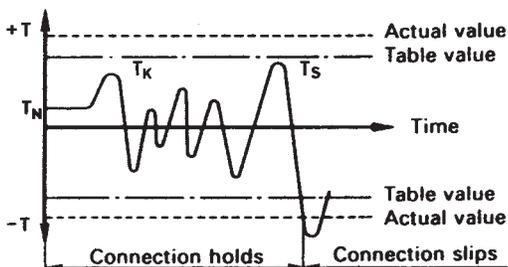


Fig. 95

## Shape factor $\alpha_k$

Proportional factor covering stress conditions at bores, cross-sections transitions, clamping points, grooves, etc. The following applies:

$$\alpha_k = \frac{\sigma_{\max}}{\sigma_n} = \frac{\text{maximum stress}}{\text{nominal stress}}$$

(use smallest cross-sections and/or resistance moments when determining  $\sigma_n$ ).

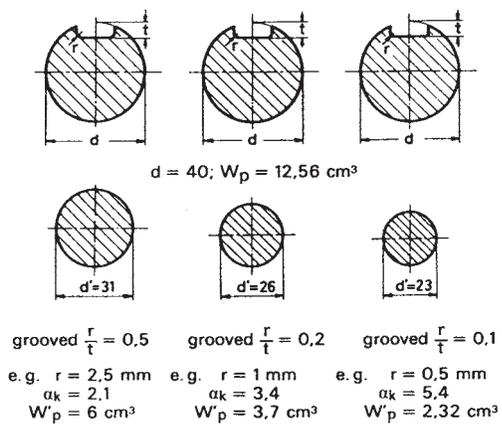


Fig. 96

Influence of the groove shape on shape factor  $\alpha_k$  and thus on the  $\rightarrow$  Polar moment of resistance; extract from the work of Prof. Thum.

For smooth shafts  $\alpha_k = 1$ .

## Slip

All shrink fits slip when overloading takes place.  $\rightarrow$  Fretting of the contact (slipping) surfaces is normally unavoidable. Locking Assemblies™ subjected to high pressures per unit of area and rotating at high peripheral speeds can be completely destroyed. Under normal circumstances, the degree and type of destruction do not indicate the cause of slipping.

## Slipping clutch

Locking devices are not suitable for use as a slipping clutch without consulting us.

## Tangential stresses

Tensile stress in the hub bore or compression stress in the bore of hollow shafts as a result of the  $\rightarrow$  Contact pressures between outer locking ring and hub and/or inner locking ring and hollow shaft.

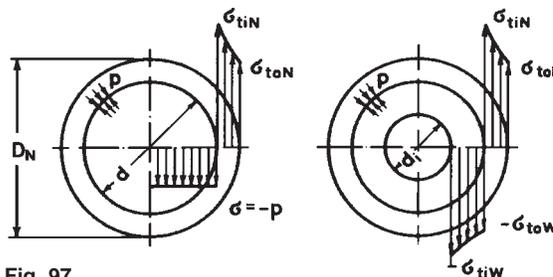


Fig. 97

Tangential stresses in shrink fits.

## Temperature, influence of

Shrink fits – and thus locking device connections, too – give perfect service as long as the contact pressure in the joint does not drop below a certain minimum value. Consequently, contact pressure in the joint at operating temperature must be the subject of close attention. Please contact us for advice.

## Torque wrench

Standard tool indicating the tightening torque exerted on the screw heads. All Ringfeder® locking devices require a torque wrench for proper installation.

## True running

The relatively narrow Locking Assemblies™ RINGFEDER® RfN 12012 serve mainly to transmit high torques and axial forces. They are not self-centering. True running of the hub/boss is thus governed by the  $\rightarrow$  Centering action and the care taken during  $\rightarrow$  Fitting.

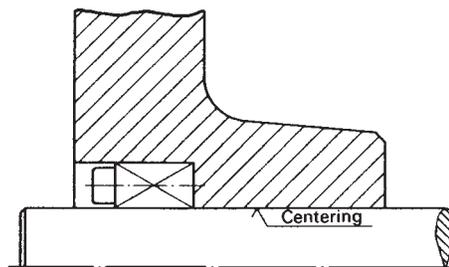


Fig. 98

Pre-centering by selection of correct fit between shaft and hub.

**NOTE: DO NOT USE IMPACT WRENCH TO INSTALL RINGFEDER® LOCKING DEVICES!**

## THE BASICS OF SELECTING A RINGFEDER® SHAFT/HUB LOCKING DEVICE

### I. INTRODUCTION

Selecting a Ringfeder® keyless shaft/hub locking device is not a difficult procedure. A few very basic facts about the application must be known and the proper device can be selected. We offer the following guidelines for choosing the best device for the application. This is not intended as a design manual. If technical help is desired, Ringfeder Corporation offers free engineering assistance.

Ringfeder® shaft/hub locking devices can be divided into two major categories; internal and external devices.

1. **Internal** devices fit *inside* a bore or counterbore in a component and clamp internally. Detailed descriptions can be found in the appropriate catalog sections.
2. **External** devices fit *over* a hub projection and clamp the component externally. Shrink Discs® in general, provide a more accurate concentricity (T.I.R. control) than internal devices. Detailed descriptions can be found in the appropriate catalog sections.

### II. REQUIRED INFORMATION

Whether the application is new or a repair is to be made to an existing connection, the following must be known:

- \* **Peak torque required;** include all shock loads and safety factors. Generally the catalog torque ratings of the devices are the maximum allowable.
- \* **Shaft size**
- \* **Hub diameter;** for internal devices hubs must have adequate wall thickness to support the forces generated by the device. The material published yield point can be inserted in the equations given in the various catalogs. If the material is not known, and it is not cast iron, it is usually safe to assume the yield point to be 36,000 psi. Avoid grey cast iron products without consulting us.
- \* **Component rotational speed;** if O.D. of component is turning more than 2000 inches/second, consult us.
- \* **Environmental conditions;** ambient temperatures, moisture, etc. Above 400 degrees F, contact us.
- \* **Condition of the shaft;** if the shaft is worn or damaged it must be repaired so as to conform to the shaft tolerances specified by the type of device chosen.
  - one keyseat may be bridged without concern.
  - for broken keys, flats or multiple keys, call us.

### III. SELECTION GUIDELINES

There will be many exceptions to these guidelines and we can't cover all possible situations. However, based on our experience the following generalizations can be made to offer a beginning in the selection process.

#### A. MOUNTING SPROCKETS

Sprockets generally use the internal devices. Sprockets include: roller chain, conveyor chain, HTD, Polychain, etc. Check for an adequate hub diameter for the required device. If the product is steel, assume a hub material yield point of 36,000 psi minimum unless you know more precisely what the material is.

#### 1. SPROCKETS WITH 'B' STYLE HUBS

For most applications on 'B' type sprockets where the length through the bore is greater than 2 x locking device width; USE 7012 or 7013.

#### 2. PLATE SPROCKETS

For plate sprockets make sure the plate is thick enough for the critical contact area of the locking device to be completely recessed in the sprocket; USE 7013.

#### 3. MULTI-STRAND SPROCKETS – HIGH TORQUES

For applications with very high torques, avoid laminated sprockets (plate sprockets butt-welded to hubs); through hub design is preferred; USE 7012, 7013 or Shrink Disc®.

### B. MOUNTING GEARS

Gears include spur, miter, bevel, spiral, and helical gears as well as cams, sheaves and other similarly constructed items.

#### 1. NARROW GEARS

For gears where the LTB (length through bore) is less than 2 x Locking Assembly™ width, 7013's offer better concentricity.

#### 2. WIDE GEARS

For wide gears where the LTB is greater than 2 x Locking Assembly™ width, any internal device appropriately sized will work.

#### 3. LARGE GEARS

For large diameter gears (bull gears) with cast iron hubs use Shrink Discs™; with steel construction, Shrink Discs® are preferred, but all devices are possible.

### C. MOUNTING COUPLINGS

Couplings include many categories of flexible and rigid types. The most common are addressed here.

1. Flexible disk-type couplings – Shrink Disc® is preferred.
2. Flexible gear or grid-type couplings – all internal devices can be used as well as the Shrink Discs® if hub construction allows.
3. Flexible jaw-type couplings – use Shrink Discs® if hubs are cast iron; all internal devices for steel hubs.
4. Rigid couplings – sleeve or flange type – Shrink Discs™ are preferred but all internal devices will work on steel hubs.

### D. MOUNTING CONVEYOR PULLEYS, ROLLS AND DRUMS

Conveyor pulleys, rolls and drums present unique applications in that they are very often subjected to high loads resulting in the shafts deflecting. This deflection must be calculated and minimized in order for the correct device to be selected. We, therefore, strongly suggest that you call us!

**Toll Free: 1-800-245-2580**

**WEB: [www.ringfeder.com](http://www.ringfeder.com)**

# RFC SPECIALTY PRODUCTS



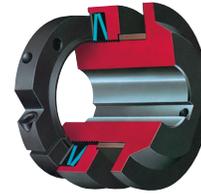
## RFC Specialty Locking Devices

Ringfeder Corporation excels at specialty keyless shaft/hub connection solutions. From 1/4" shafts to 30" shafts, our engineers have the solution.



## BALL DETENT TORQUE LIMITERS Type BD

These accurate ball/roller and socket torque limiters are easily adjustable for different torque settings. In the event of an overload, personnel and equipment are protected as these devices disconnect mechanically and make contact with a limit switch that sounds and alarm or otherwise shuts the drive down. Available in various configurations and combinations with couplings.



## FRICTION TORQUE LIMITER Type FC

Easily adjustable, these torque limiters rely on friction to transmit the set torque. When an overload occurs, these devices slip until the overload is removed or the machine is reset. Available in various configurations and combinations with couplings.



## RING-flex® Single Flexing and Double Flexing Couplings with Ringfeder® Shrink Discs®

Assure a totally backlash-free connection with precise synchronization capability. Additional features: Clearance fits for hub/shaft connection allow easy assembly and free axial movement compensation during installation which eliminates unwanted pre-loading or pre-stressing of the flexible elements.



## ARCUSAFLEX® Flywheel Couplings

Highly flexible, backlash-free, vulcanized rubber disc couplings designed to couple the flywheel of an internal combustion engine to the shaft of the driven machine. Rubber disc element accepts relatively high angular, axial and parallel misalignments. Flange dimensions according to SAE J620 standards.



## Multi Mont OCTA Flywheel Couplings

Torsionally flexible, economical flange couplings for connecting the flywheel of a combustion engine to the input shaft of a driven machine. Rubber elements dampen vibrations and accommodate misalignments.

*In accordance with our established policy to constantly improve our products, the specifications contained herein are subject to change without notice.*

*Since our Engineers cannot be aware of all applications and cannot control all the factors that may affect the function of our products, our warranty applies to our products only.*

## TECHNICAL ASSISTANCE

**Call us Toll Free at 1-800-245-2580**

Please let us know what your specific requirements are and we shall be very happy to work out detailed recommendations without any obligation. Just send a sketch with your requirements and specifications.

**Call or write for more information.**

Visit our website: [www.ringfeder.com](http://www.ringfeder.com)

## Our Representative:

### RINGFEDER CORPORATION

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Westwood, NJ 07675

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Los Angeles Office: TEL (805) 382-9900 • FAX (805) 382-9980



# RINGFEDER

# RFC

# RING-flex®

## Torsionally Rigid Disc Couplings



# RING-flex® Couplings

## Advantages and Features



- Accommodate Angular, Axial, and Radial Misalignments
- Operate Without Wear
- NO Maintenance or Lubrication
- High Torsional Rigidity
- Operate at High Temperatures
- Long Life
- All Metal Construction
- NO Backlash
- High Torque Capacity
- Low Restoring Force

## RING-flex® Couplings 6 and 8 bolt disc design

- Higher Speed Capacities
- Increased Angular Misalignment Capacity (6 bolt = 1° – 1.5°)
- Disc Pack can be Piloted to Hub for Repeatable Balancing per API 671.
- Fail-safe Hardware Available

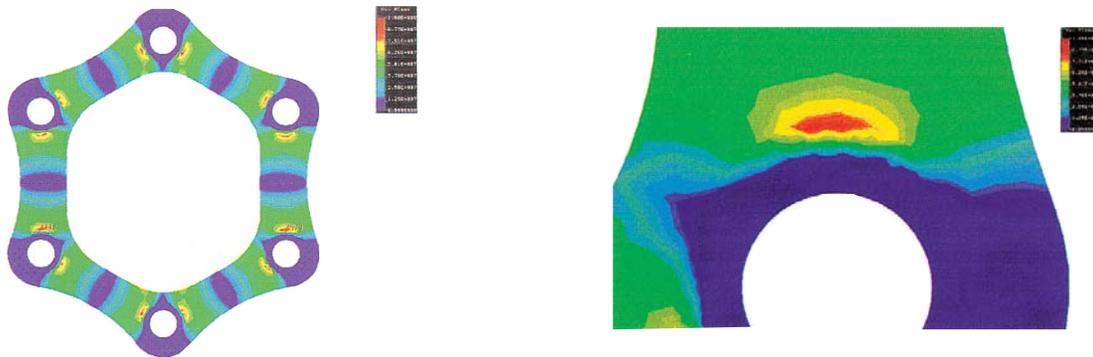


Fig. 1

Finite Element Analysis

Ringfeder Corporation is very happy to introduce a “NEW” laminated disc pack, which allows higher misalignments and speed capacities than previous designs. The design was developed through Finite Element Analysis to maximize the allowable misalignment and disc pack life without losing any torque capacity.

# RING-flex® Couplings with Ringfeder® Shrink Discs®

- Eliminates ALL Backlash in Hub Connection
- Eliminates Interference and Press Fit in Hub Connection
- Allows Axial Flexibility during Assembly
- Great for Last Minute Timing Between Hubs
- Eliminates Failures from Poorly Fit Keys

## WORKING PRINCIPLE

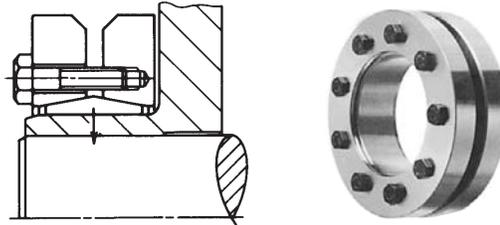


Fig. 2

Shrink Disc® over hub projection

Shrink Discs® are external keyless shaft/hub locking devices installed over hub projections. By tightening the locking screws, the locking collars exert radial forces on the tapered inner rings and the hub. After bridging the fit clearances, radial clamping pressure is generated between shaft and hub establishing a solid, frictional connection. For adjustment or removal, just loosen the screws.

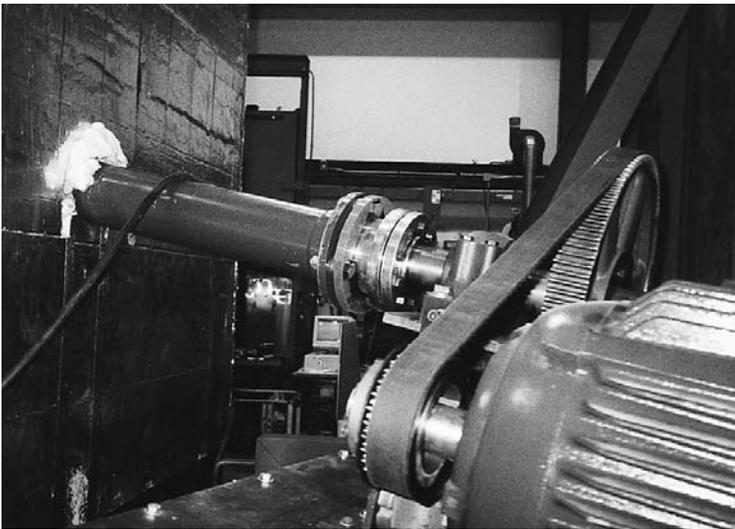


Fig. 3 RING-flex® coupling with Ringfeder Shrink Discs® on main drive in environmental test chamber.

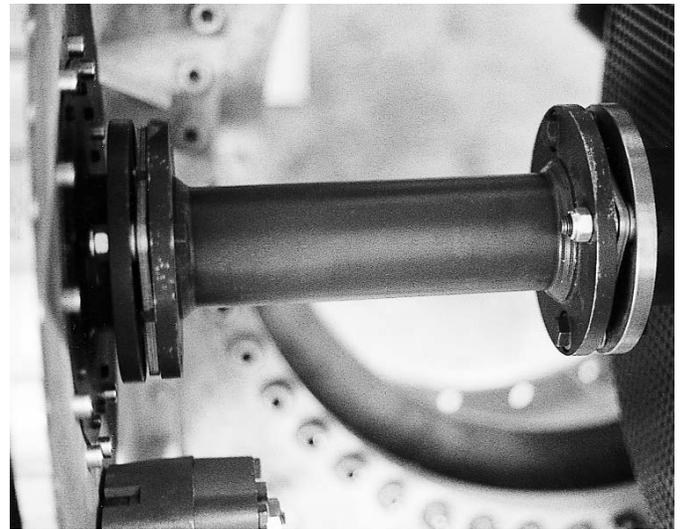


Fig. 4 RING-flex® coupling on fan drive.

## RING-flex® Couplings – Unique designs available

Ringfeder Corporation has a large engineering staff that specializes in providing unique solutions to your coupling requirements. These solutions can include the following:

Flange Mounted Couplings

Close-Coupled Couplings

Extra Long Couplings

Fail-Safe Couplings

High Speed Couplings

Please call for assistance.

# Range and Characteristics

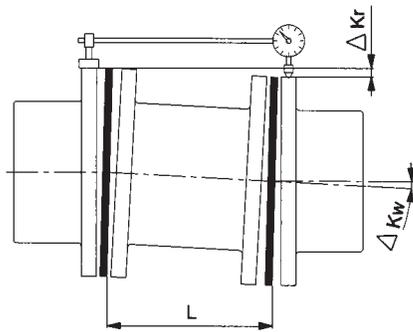
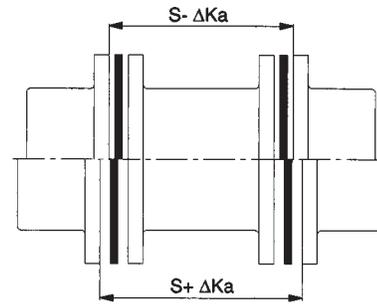
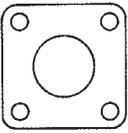


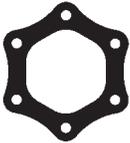
Fig. 5 Angular and radial misalignment



Axial misalignment

<b>SERIES G</b>		NOMINAL TORQUE CAPACITY	OUTSIDE DIAMETER	MAX. SPEED UNBALANCED	AXIAL MISALIGN.	
Applications: Economical design for general purpose use at low and medium speeds with good flexibility and low end thrust. See pages 10-12.		(in-lbs)	(inches)	(rpm)	+/- $K_a$	
SIZE		(Nm)	(mm)		(inches)	
					(mm)	
 <p>4 Bolt Design Element Pack consists of individual discs</p> <p>Misalignment Capability angular: <math>K_w = 1^\circ</math> per element axial: <math>K_a =</math> Double Flexing Single Flexing = <math>K_a/2</math> radial: <math>K_r = 0.017</math> inches x L where 'L' = distance between disc pack</p>	G 10-4	797 90	3.19 81	4500	0.11 2.7	
	G 20-4	1593 180	3.66 93	4300	0.12 3.0	
	G 30-4	2213 250	4.09 104	4200	0.15 3.7	
	G 40-4	5045 570	4.96 126	4000	0.17 4.2	
	G 50-4	7878 890	5.63 143	3800	0.19 4.9	
	G 60-4	10090 1140	6.61 168	3600	0.25 6.4	
	G 70-4	15932 1800	7.64 194	3000	0.27 6.9	
	G 80-4	21685 2450	8.43 214	3000	0.31 8.0	
	GS - Single Flexing	XGS - Single Flexing w/SD				
	GD - Double Flexing	XGD - Double Flexing w/SD				
GC - Close Coupled	XGC - Close Coupled w/SD					

# Range and Characteristics

<b>SERIES H</b>		NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	OUTSIDE DIAMETER (inches) (mm)	MAX. SPEED UNBALANCED (rpm)	AXIAL MISALIGN. +/- $K_a$ (inches) (mm)	
Applications: <b>NEW</b> laminated disc pack design for applications requiring higher speeds and greater misalignment capability. See pages 13, 14, 17 and 18.						SIZE
 <p>6 Bolt Design Laminated Disc Pack</p> <p>Misalignment Capability angular: <math>K_w = 1.5^\circ</math> per element up to size 185 = <math>1^\circ</math> per element above size 185 axial: <math>K_a =</math> Double Flexing Single Flexing = <math>K_a/2</math> radial: <math>K_r = 0.026</math> inches x L, up to size 185 0.017 inches x L, above size 185 where 'L' = distance between disc pack</p>		5090 575	4.33 110	7200	0.08 2.1	
		132-6	9740 1100	5.20 132	5840	0.10 2.6
		158-6	17700 2000	6.22 158	4920	0.12 3.1
		185-6	29210 3300	7.28 185	4200	0.15 3.7
		202-6	40710 4600	7.95 202	3840	0.15 3.8
		228-6	61960 7000	8.98 228	3400	0.17 4.2
		255-6	90280 10200	10.04 255	3080	0.19 4.7
		278-6	125680 14200	10.94 278	2800	0.20 5.2
		302-6	177010 20000	11.89 302	2560	0.22 5.7
		325-6	221270 25000	12.80 325	2400	0.26 6.5
		345-6	274370 31000	13.58 345	2200	0.27 6.9
		380-6	374390 42300	14.96 380	2040	0.30 7.6
		410-6	505380 57100	16.14 410	1880	0.32 8.2
		440-6	650530 73500	17.32 440	1740	0.35 8.8
		475-6	814270 92000	18.70 475	1680	0.37 9.5
		505-6	1035500 117000	19.88 505	1520	0.40 10.1
HS - Single Flexing	XHS - Single Flexing w/SD					
HD - Double Flexing	XHD - Double Flexing w/SD					
HC - Close Coupled						

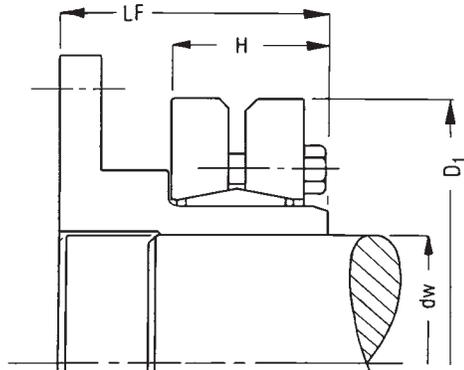
# Range and Characteristics

<b>SERIES H</b>		NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	OUTSIDE DIAMETER (inches) (mm)	MAX. SPEED UNBALANCED (rpm)	AXIAL MISALIGN. +/- $K_a$ (inches) (mm)
Applications: <b>NEW</b> laminated disc pack design for applications requiring higher torques and greater misalignment capability. See pages 15, 16, 19 and 20.					
 <p>8 Bolt Design Laminated Disc Pack</p> <p>Misalignment Capability angular: <math>K_w = 0.5^\circ</math> per element axial: <math>K_a = \text{Double Flexing}</math> Single Flexing = <math>K_a/2</math> radial: <math>K_r = 0.009</math> inches x L where 'L' = distance between disc pack</p>	278-8	177000 20000	10.94 278	2800	0.15 3.7
	302-8	266000 30000	11.89 302	2560	0.16 4
	325-8	327000 37000	12.80 325	2400	0.17 4.3
	345-8	407000 46000	13.58 345	2200	0.18 4.6
	380-8	558000 63000	14.96 380	2040	0.20 5
	410-8	761000 86000	16.14 410	1880	0.21 5.4
	440-8	974000 110000	17.32 440	1740	0.23 5.8
	475-8	1221000 138000	18.70 475	1680	0.25 6.3
	505-8	1549000 175000	19.88 505	1520	0.26 6.7
	540-8	1947000 220000	21.26 540	1440	0.28 7.2
	570-8	2292000 259000	22.44 570	1360	0.30 7.6
	605-8	2788000 315000	23.82 605	1280	0.31 7.8
	635-8	3390000 383000	25.00 635	1240	0.32 8.2
	675-8	4018000 454000	26.57 675	1160	0.33 8.4
	700-8	4673000 528000	27.56 700	1120	0.35 8.9
	730-8	5381000 608000	28.74 730	1080	0.36 9.2
	760-8	6196000 700000	29.92 760	1040	0.38 9.6
	HS - Single Flexing HD - Double Flexing HC - Close Coupled	XHS - Single Flexing w/SD XHD - Double Flexing w/SD			

# RINGFEDER SHRINK DISC® SPECIFICATIONS

## Shrink Disc® Dimensions - Low Inertia Series

SHRINK DISC SIZE	SHAFT RANGE $d_w$		MAX TORQUE CAPACITY RANGE $M_T$		$D_1$ (inches) (mm)	H (inches) (mm)
	(inches) (mm)	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)		
10	0.24	0.31	36	144	1.18	0.58
	6	8	4.1	16.3	30	14.8
13	0.31	0.43	130	410	1.30	0.61
	8	11	14.7	46.3	33	15.5
16	0.43	0.55	349	730	1.50	0.69
	11	14	39.4	82.5	38.1	17.5
24	0.55	0.79	722	1750	1.87	0.75
	14	20	81.6	198	47.5	19.0
30	0.79	1.02	1335	2800	2.10	0.83
	20	26	151	316	53.3	21.0
36	1.02	1.26	3250	5690	2.50	0.93
	26	32	367	643	63.5	23.5
44	1.26	1.46	4612	6900	2.85	1.00
	32	37	521	780	72.4	25.4
50	1.46	1.69	5374	9000	3.19	1.08
	37	42.9	607	1017	81	27.5



Hub configuration for Shrink Disc® connection  
Fig. 6

## Shrink Disc® Dimensions - 4071 Series

RfN 4071 SIZE	SHAFT RANGE $d_w$		MAX TORQUE CAPACITY RANGE $M_T$		$D_1$ (inches) (mm)	H (inches) (mm)
	(inches) (mm)	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)		
24	0.75	0.83	1505	2213	1.97	0.91
	19	21	170	250	50	23
30	0.83	1.02	1668	3275	2.36	0.98
	21	26	188	370	60	25
36	1.02	1.25	3894	5576	2.83	1.08
	26	31.8	440	630	72	27.5
44	1.25	1.42	6287	7612	3.15	1.16
	31.8	36	710	860	80	29.5
50	1.42	1.65	8316	12214	3.54	1.24
	36	42	940	1380	90	31.5
55	1.65	1.89	10267	16639	3.94	1.36
	42	48	1160	1880	100	34.5
62	1.89	2.04	16374	21242	4.33	1.36
	48	52	1850	2400	110	34.5
68	1.97	2.36	17701	27880	4.53	1.36
	50	60	2000	3150	115	34.5
75	2.17	2.56	22127	34960	5.43	1.50
	55	65	2500	3950	138	38
80	2.36	2.76	28322	40713	5.71	1.50
	60	70	3200	4600	145	38
90	2.56	2.95	42048	64176	6.10	1.75
	65	75	4750	7250	155	44.5
100	2.76	3.15	61070	79656	6.69	1.95
	70	80	6900	9000	170	49.5
110	2.95	3.35	63725	95588	7.28	2.24
	75	85	7200	10800	185	57
125	3.35	3.74	97358	132761	8.46	2.40
	85	95	11000	15000	215	61
140	3.74	4.13	133646	177899	9.06	2.70
	95	105	15100	20100	230	68.5
155	4.13	4.53	194716	247820	10.43	2.85
	105	115	22000	28000	265	72.5
165	4.53	4.92	274372	345178	11.42	3.19
	115	125	31000	39000	290	81
175	4.92	5.31	318626	398282	11.81	3.19
	125	135	36000	45000	300	81

RfN 4071 SIZE	SHAFT RANGE $d_w$		MAX TORQUE CAPACITY RANGE $M_T$		$D_1$ (inches) (mm)	H (inches) (mm)
	(inches) (mm)	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)		
185	5.31	5.71	460237	548745	12.99	3.78
	135	145	52000	62000	330	96
195	5.51	6.10	575297	721334	13.78	3.78
	140	155	65000	81500	350	96
200	5.91	6.30	654984	761208	13.78	3.78
	150	160	74000	86000	350	96
220	6.30	6.69	840818	973579	14.57	4.49
	160	170	95000	110000	370	114
240	6.69	7.48	1062086	1380712	15.94	4.80
	170	190	120000	156000	405	122
260	7.48	8.27	1451518	1814398	16.93	5.24
	190	210	164000	205000	430	133
280	8.27	9.06	1920708	2389824	18.11	5.79
	210	230	217000	270000	460	147
300	9.06	9.65	2433948	2787977	19.09	6.10
	230	245	275000	315000	485	155
320	9.45	10.24	2761425	3310169	20.47	6.10
	240	260	312000	374000	520	155
340	9.84	10.63	3451781	4071331	22.44	6.65
	250	270	390000	460000	570	169
350	10.63	11.22	3912018	4425360	22.83	6.89
	270	285	442000	500000	580	175
360	11.02	11.61	4097883	4620076	23.23	6.89
	280	295	463000	522000	590	175
380	11.42	12.20	5018358	5823774	25.39	7.20
	290	310	567000	658000	645	183
390	11.81	12.60	5522849	6354817	25.98	7.20
	300	320	624000	718000	660	183
400	12.40	12.99	5929982	6584936	26.77	7.20
	315	330	670000	744000	680	183
420	12.99	13.78	6903562	7965648	27.17	7.99
	330	350	780000	900000	690	203
440	13.39	14.17	7134000	8116548	29.53	8.54
	340	360	806000	917000	750	217

If  $M_T$  is less than coupling torque capacity, the max Coupling Torque Capacity= $M_T$

# SELECTION GUIDE

The selection of the coupling size depends entirely on the torque to be transmitted and required shaft sizes. However, for the selection of the coupling type, application conditions (e.g., shaft misalignments, expansions and operating speeds) must be taken into consideration. For any special applications, please consult with us.

When selecting a coupling size, make sure that under all operating conditions its torque capacity and speed range are not exceeded.

1. Calculate the driving torque ( $T_{AN}$ ) to be transmitted from

$$T_{AN}(\text{in-lbs}) = 63000 \times \text{HP/RPM}$$

2. Determine required coupling Nominal Torque Capacity ( $T_{KN}$ ) by finding the appropriate service factor ( $S_M$ ) in Table 1 for your application. Multiply the torque calculated above ( $T_{AN}$ ) by this service factor.

$$T_{KN}(\text{in-lbs}) = T_{AN} \times S_M$$

NOTE: RING-flex® Couplings can transmit higher torques for a short period of time without having to consider an additional service factor. Please consult coupling data sheets (pages 10-20) for Maximum Torque values.

3. Check if existing or predicted axial, angular and radial misalignment are within permissible values as shown in the catalog, pages 4-6. If any one of the misalignments is close to the maximum allowable, the maximum misalignment in the other directions and the torque capacity will be effected. For this reason, we recommend selecting a coupling with more misalignment capacity than required.
4. Verify that the maximum hub bore and speed required do not exceed the maximum values for the coupling.

NOTE: For a given hub size, larger shafts can be used with the RINGFEDER Shrink Disc® than with traditional keyed connections.

5. If the RINGFEDER Shrink Disc® connection is used, verify that the torque capacity of the Shrink Disc® connection does not limit the couplings torque capacity. The Shrink Disc® torque capacities for each shaft size can be found on page 7.
6. Use the chart below to verify that your coupling does or does not need to be dynamically balanced.

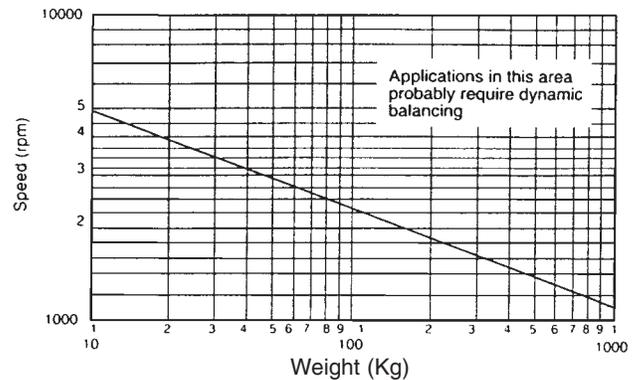


Fig. 7 Dynamic Balancing Guide

Table 1 Service Factor ( $S_m$ )

Load	Driven Equipment	Driving Equipment	
		Motor or Turbine	Reciprocating Engine
Uniform	Centrifugal Pumps; Conveyors-Evenly Loaded; Alternators; Fans and Blowers-Light Duty; Generators-Evenly Loaded; Mixers-Liquid	1.0	1.5
Light Shock	Centrifugal Pumps; Generators-Pulsating Load; Grinders; Hydraulic Pumps; Machine Tools; Oscillating Pumps, Textile Machinery; Woodworking Machinery	1.5	2.0
Medium Shock	Air Compressors-Multi-Cylinder; Cranes; Elevators; Hoists; Punch Presses; Reciprocating Pumps; Ship Drives	2.0	2.5
Heavy Shock	Air Compressors-Single Cylinder; Dredges; Drilling Rigs; Mining Machinery; Rubber Mixers	2.5	3.0

The service factors listed are intended only as a general guide. For typical service factors used in various applications, refer to "AGMA Standard Load Classification and Service Factors for Flexible Couplings" (AGMA 514.02)

## Selection Example #1 – Bore and Keyway:

A 60 HP, 4 cylinder diesel engine is to drive a centrifugal pump at 1750 rpm. Both shafts are 1.5" in diameter. Distance between shaft ends is 3.5".

1. A coupling with (2) Disc Pack is required, because the engine crank shaft and pump shaft are most likely supported by two bearings. Therefore, parallel misalignment between the shafts is possible.
2. Driving Torque:  
 $T_{AN}(\text{in-lbs}) = 63000 \times 60 / 1750 = 2160 \text{ in-lbs}$
3. Required Coupling torque capacity based on a  $S_M = 2.0$ :  
 $T_{KN}(\text{in-lbs}) = 2160 \times (2.0) = 4320 \text{ in-lbs}$

### Selected Coupling

HD 110-6:  $T_{KN}(\text{in-lbs}) = 5090 \text{ in-lbs} \geq 4320 \text{ in-lbs}$

This coupling can also accommodate the 1750 rpm without dynamic balancing, the 3.5" between shaft ends and the (2) 1.5" shafts.

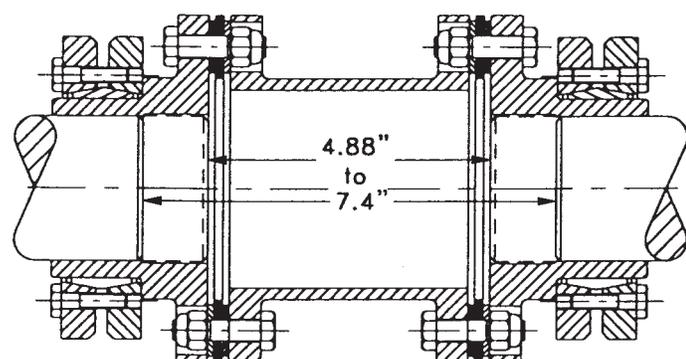


Fig. 8

## Selection Example #2 – Shrink Disc® Connection:

A 200 HP motor is driving a gearbox at 1750 rpm. This drive is running the transfer system for an automated machining system. The system starts and stops 10 times per minute. Both shaft sizes are 2.5". Distance between shaft ends is 6".

1. A coupling with (2) Disc Pack is required, because the motor and gearbox shafts are most likely both supported by two bearings. Therefore, parallel misalignment between the shafts is possible.
2. Driving Torque:  
 $T_{AN}(\text{in-lbs}) = 63000 \times 200 / 1750 = 7200 \text{ in-lbs}$
3. Required Coupling torque capacity based on a  $S_M = 2.0$ :  
 $T_{KN}(\text{in-lbs}) = 7200 \times (2.0) = 14400 \text{ in-lbs}$

### Selected Coupling

XHD 158-6:  $T_{KN}(\text{in-lbs}) = 17700 \text{ in-lbs} > 14400 \text{ in-lbs}$

This coupling can also accommodate the 1750 rpm without dynamic balancing, and the (2) 2.5" shafts.

4. Select a Shrink Disc® for a 2.5" shaft on page 7. Shrink Disc® Size: 75 Rfn 4071  
 Torque Capacity of Shrink Disc® = 34000 in-lbs

This reduces the coupling's maximum torque capacity of 35400 in-lbs to 34000 in-lbs.

5. With the RINGFEDER Shrink Disc® Connection, the 6" distance between shaft ends can be accommodated with the standard double flexing coupling. The shaft needs to be only 1.5" in each hub to ensure a proper Shrink Disc® Connection. This gives the coupling the flexibility to have a distance between shafts of 4.88" to 7.4". 6" is in that range. See Fig. 8.

# SPECIFICATIONS

## GS Coupling — 4 BOLT

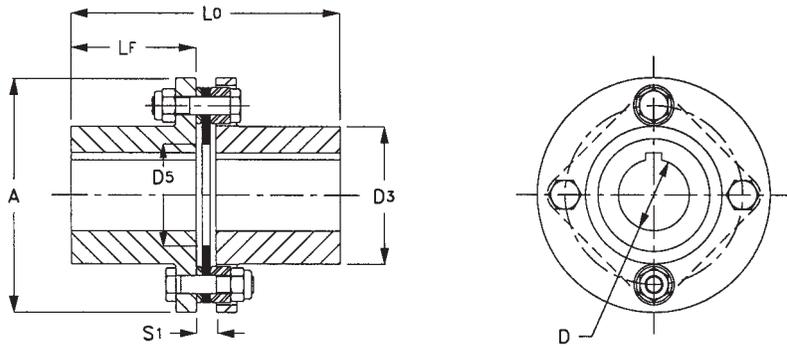


Fig. 9

COUPLING SIZE	A (inches) (mm)	D max (inches) (mm)	D <sub>3</sub> (inches) (mm)	D <sub>5</sub> (inches) (mm)	L <sub>F</sub> (inches) (mm)	S <sub>1</sub> (inches) (mm)	L <sub>0</sub> (inches) (mm)	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>a</sub> (inches) (mm)	ANGULAR MISALIGN. K <sub>w</sub>
GS 10-4	3.19 81	1.25 32	1.77 45	1.14 29	1.97 50	0.27 6.9	4.21 106.9	797 90	1196 135	4500	2.6 1.2	2.46 0.0007	0.05 1.4	1°
GS 20-4	3.66 93	1.38 35	1.97 50	1.26 32	2.17 55	0.32 8.1	4.65 118.1	1593 180	2390 270	4300	3.9 1.8	5.03 0.001	0.06 1.5	1°
GS 30-4	4.09 104	1.63 41	2.40 61	1.58 40	2.17 55	0.34 8.6	4.67 118.6	2213 250	3320 375	4200	5.3 2.4	8.63 0.003	0.07 1.8	1°
GS 40-4	4.96 126	1.88 48	2.76 70	1.77 45	2.56 65	0.48 12.2	5.60 142.2	5045 570	7568 855	4000	9.4 4.3	22.5 0.007	0.08 2.1	1°
GS 50-4	5.63 143	2.13 54	3.19 81	1.97 50	2.76 70	0.50 12.7	6.01 152.7	7878 890	11817 1335	3800	14.7 6.7	44.3 0.013	0.10 2.4	1°
GS 60-4	6.61 168	2.94 75	4.13 105	2.68 68	2.95 75	0.56 14.1	6.47 164.2	10090 1140	15135 1710	3600	20.1 9.1	93.3 0.027	0.13 3.2	1°
GS 70-4	7.64 194	2.76 70	4.65 118	2.99 76	3.54 90	0.61 15.5	7.70 196	15932 1800	23898 2700	3000	36 16.4	201.6 0.059	0.14 3.5	1°
GS 80-4	8.43 214	4.33 110	5.35 136	3.50 89	4.33 110	0.81 20.6	9.47 240.6	21685 2450	32528 3675	3000	51 23.2	349.5 0.102	0.16 4.0	1°

Hub = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with standard keyways  
Weight and Moment of Inertia - Assuming maximum bores

## XGS Coupling — 4 BOLT with Shrink Disc® connection

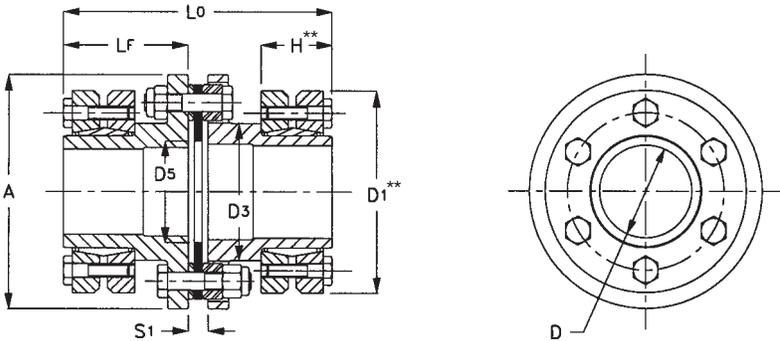


Fig. 10

COUPLING SIZE	A (inches) (mm)	SHRINK DISC SERIES Rfn 4071 MAX	D MAX (inches) (mm)	D <sub>3</sub> (inches) (mm)	D <sub>5</sub> (inches) (mm)	L <sub>F</sub> (inches) (mm)	S <sub>1</sub> (inches) (mm)	L <sub>0</sub> (inches) (mm)	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN +/- K <sub>a</sub> (inches) (mm)	ANGULAR MISALIGN K <sub>w</sub>
XGS 10-4	3.19 81	36	1.25 32	1.77 45	1.14 29	1.97 50	0.27 6.9	4.21 106.9	797 90	1196 135	4500	3.9 1.8	4.74 0.0014	0.05 1.4	1°
XGS 20-4	3.66 93	44	1.42 36	1.97 50	1.26 32	2.17 55	0.32 8.1	4.65 118.1	1593 180	2390 270	4300	6.2 2.8	8.89 0.003	0.06 1.5	1°
XGS 30-4	4.09 104	55	1.89 48	2.40 61	1.58 40	2.17 55	0.34 8.6	4.67 118.6	2213 250	3320 375	4200	8.6 3.9	19.6 0.006	0.07 1.8	1°
XGS 40-4	4.96 126	62	2.05 52	2.76 70	1.77 45	2.56 65	0.48 12.2	5.60 142.2	5045 570	7568 855	4000	13.4 6.1	38.0 0.011	0.08 2.1	1°
XGS 50-4	5.63 143	80*	2.76 70	3.19 81	1.97 50	2.76 70	0.50 12.7	6.01 152.7	7878 890	11817 1335	3800	22.7 10.3	97.2 0.028	0.10 2.4	1°
XGS 60-4	6.61 168	90*	2.95 75	4.13 105	2.68 68	2.95 75	0.56 14.1	6.47 164.2	10090 1140	15135 1710	3600	30.9 14.0	171.4 0.050	0.13 3.2	1°
XGS 70-4	7.64 194	90	3.35 85	4.65 118	2.99 76	3.54 90	0.61 15.5	7.70 196	15932 1800	23898 2700	3000	51 23.2	262.3 0.077	0.14 3.5	1°
XGS 80-4	8.43 214	125	3.74 95	5.35 136	3.50 89	4.33 110	0.81 20.6	9.47 240.6	21685 2450	32528 3675	3000	78 35.5	758.3 0.222	0.16 4.0	1°

Hub = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with Shrink Disc® Connection  
Weight and Moment of Inertia - Assuming maximum bores and Shrink Disc®  
\* Shrink Disc® bolts hang over hub end  
\*\* For Dimensions 'D<sub>1</sub>' and 'H' please see page 7

# SPECIFICATIONS

## GC Coupling — 4 BOLT

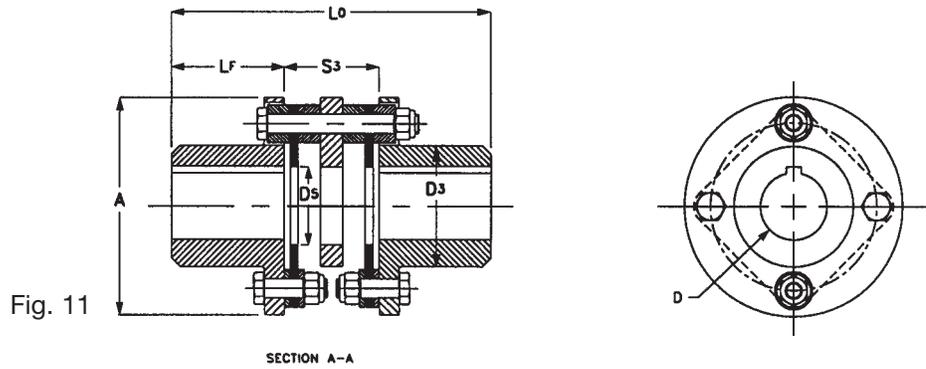


Fig. 11

SECTION A-A

COUPLING SIZE	A	D MAX	D <sub>3</sub>	D <sub>5</sub>	L <sub>F</sub>	S <sub>3</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY (in-lbs)	MAXIMUM TORQUE CAPACITY (in-lbs)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>s</sub> (inches)	ANGULAR MISALIGN. K <sub>w</sub> PER DISC PACK (degrees)	RADIAL MISALIGN. K <sub>r</sub> (inches)
	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)		(kg)	(kg-m <sup>2</sup> )	(mm)		(mm)						
GC 10-4	3.19	1.25	1.77	1.14	1.97	1.46	5.40	797	1196	4500	3.2	2.82	0.11	1°	0.02
	81	32	45	29	50	37	137	90	135		1.5	0.001	2.7		2.7
GC 20-4	3.66	1.38	1.97	1.26	2.17	1.60	5.94	1593	2390	4300	4.9	5.94	0.12	1°	0.02
	93	35	50	32	55	41	151	180	270		2.2	0.002	3.0		2.7
GC 30-4	4.09	1.63	2.40	1.58	2.17	1.58	5.92	2213	3320	4200	6.5	10.0	0.15	1°	0.02
	104	41	61	40	55	40	150	250	375		2.9	0.003	3.7		2.7
GC 40-4	4.96	1.88	2.76	1.77	2.56	2.17	7.29	5045	7568	4000	11.8	26.7	0.17	1°	0.03
	126	48	70	45	65	55	185	570	855		5.4	0.008	4.2		2.7
GC 50-4	5.63	2.13	3.19	1.97	2.76	2.58	8.10	7878	11817	3800	17.8	52.8	0.19	1°	0.04
	143	54	81	50	70	66	206	890	1335		8.1	0.015	4.9		2.7
GC 60-4	6.61	2.94	4.13	2.68	2.95	2.66	8.56	10090	15135	3600	23.7	116.1	0.25	1°	0.04
	168	75	105	68	75	68	217	1140	1710		10.8	0.034	6.4		2.7
GC 70-4	7.64	2.76	4.65	2.99	3.54	3.36	10.44	15932	23898	3000	45.5	244	0.27	1°	0.02
	194	70	118	76	90	85	265	1800	2700		20.7	0.071	6.9		1.2
GC 80-4	8.43	4.33	5.35	3.50	4.33	3.34	12.00	21685	32528	3000	63.6	416.7	0.31	1°	0.05
	214	110	136	89	110	84.8	305	2450	3675		28.9	0.122	8.0		1.2

Hub = Steel  
 Spacer = Steel  
 Disc Pack = Stainless Steel  
 Hardware = Steel

Hubs can be shorter upon request - Call Ringfeder Corp.  
 Max 'D' is for bores with standard keyways  
 Weight and Moment of Inertia - Assuming maximum bores

## XGC Coupling — 4 BOLT with Shrink Disc® connection

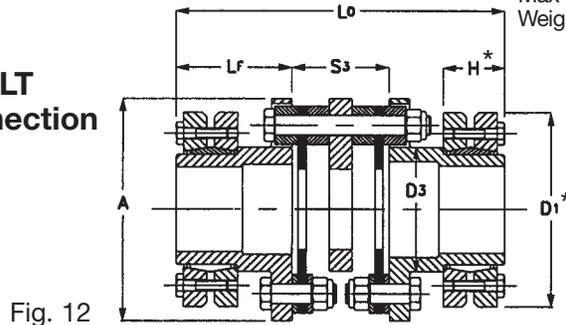


Fig. 12

SECTION A-A

COUPLING SIZE	A	SHRINK DISC SERIES Rfn 4071 MAX	D MAX	D <sub>3</sub>	D <sub>5</sub>	L <sub>F</sub>	S <sub>3</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY (in-lbs)	MAXIMUM TORQUE CAPACITY (in-lbs)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>s</sub> (inches)	ANGULAR MISALIGN. K <sub>w</sub> PER DISC PACK (degrees)	RADIAL MISALIGN. K <sub>r</sub> (inches)
	(inches) (mm)		(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)		(kg)	(kg-m <sup>2</sup> )	(mm)		(mm)
XGC 10-4	3.19	36	1.25	1.77	1.14	1.97	1.46	5.40	797	1196	4500	4.4	5.10	0.11	1°	0.02
	81		32	45	29	50	37	137	90	135		2.0	0.001	2.7		2.7
XGC 20-4	3.66	44	1.42	1.97	1.26	2.17	1.60	5.94	1593	2390	4300	7.2	9.80	0.12	1°	0.02
	93		36	50	32	55	41	151	180	270		3.3	0.003	3.0		2.7
XGC 30-4	4.09	50	1.65	2.40	1.58	2.17	1.58	5.92	2213	3320	4200	9.0	16.2	0.15	1°	0.02
	104		42	61	40	55	40	150	250	375		4.1	0.005	3.7		2.7
XGC 40-4	4.96	62	2.05	2.76	1.77	2.56	2.17	7.29	5045	7568	4000	15.8	42.2	0.17	1°	0.03
	126		52	70	45	65	55	185	570	855		7.2	0.012	4.2		2.7
XGC 50-4	5.63	68	2.36	3.19	1.97	2.76	2.58	8.10	7878	11817	3800	20.7	68.3	0.19	1°	0.04
	143		60	81	50	70	66	206	890	1335		9.4	0.020	4.9		2.7
XGC 60-4	6.61	80	2.76	4.13	2.68	2.95	2.66	8.56	10090	15135	3600	32.3	161.9	0.25	1°	0.04
	168		70	105	68	75	68	217	1140	1710		14.7	0.047	6.4		2.7
XGC 70-4	7.64	90	3.35	4.65	2.99	3.54	3.36	10.44	15932	23898	3000	59.7	304.6	0.27	1°	0.05
	194		85	118	76	90	85	265	1800	2700		27.1	0.089	6.9		1.2
XGC 80-4	8.43	125	3.74	5.35	3.50	4.33	3.34	12.00	21685	32528	3000	90.1	652.8	0.31	1°	0.05
	214		95	136	89	110	84.8	305	2450	3675		41.0	0.191	8.0		1.2

Hub = Steel  
 Spacer = Steel  
 Disc Pack = Stainless Steel  
 Hardware = Steel

Hubs can be shorter upon request - Call Ringfeder Corp.  
 Max 'D' is for bores with Shrink Disc® Connection  
 Weight and Moment of Inertia - Assuming maximum bores and Shrink Disc®  
 \* For Dimensions 'D<sub>1</sub>' and 'H' please see page 7

# SPECIFICATIONS

## GD Coupling — 4 BOLT

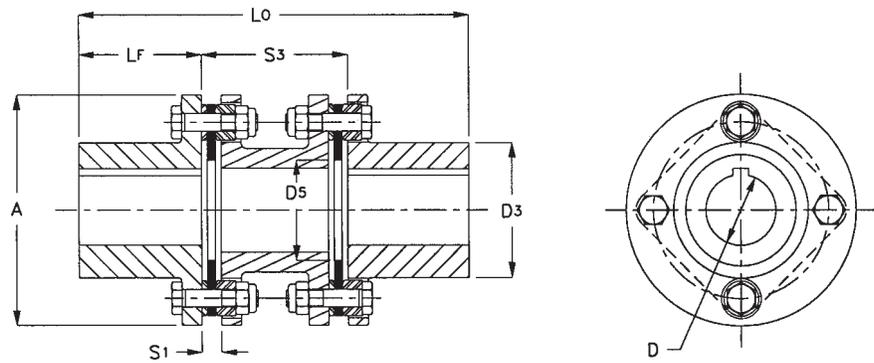


Fig. 13

COUPLING SIZE	A	D MAX	D <sub>3</sub>	D <sub>5</sub>	L <sub>F</sub>	S <sub>1</sub>	S <sub>3</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY	MAXIMUM TORQUE CAPACITY	MAXIMUM SPEED UNBALANCED	WEIGHT	MOMENT OF INERTIA	AXIAL MISALIGN.	ANGULAR MISALIGN.	RADIAL MISALIGN.
	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)	(rpm)	(lbs) (kg)	WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	+/- K <sub>a</sub> (inches) (mm)	K <sub>w</sub> PER DISC PACK	K <sub>r</sub> (inches) (mm)							
GD 10-4	3.19 81	1.25 32	1.77 45	1.14 29	1.97 50	0.27 6.9	2.25 57	6.19 157	797 90	1196 135	4500	4.3 2.0	4.07 0.001	0.11 2.7	1°	0.02 0.5
GD 20-4	3.66 93	1.38 35	1.97 50	1.26 32	2.17 55	0.32 8.1	2.75 70	7.09 180	1593 180	2390 270	4300	6.8 3.1	8.4 0.002	0.12 3.0	1°	0.02 0.6
GD 30-4	4.09 104	1.63 41	2.40 61	1.58 40	2.17 55	0.34 8.6	2.59 66	6.93 176	2213 250	3320 375	4200	8.8 4.0	14.2 0.004	0.15 3.7	1°	0.02 0.5
GD 40-4	4.96 126	1.88 48	2.76 70	1.77 45	2.56 65	0.48 12.2	3.31 84	8.43 214	5045 570	7568 855	4000	16.1 7.3	38.4 0.011	0.17 4.2	1°	0.03 0.7
GD 50-4	5.63 143	2.13 54	3.19 81	1.97 50	2.76 70	0.50 12.7	3.64 92	9.16 233	7878 890	11817 1335	3800	25.6 11.6	76.4 0.022	0.19 4.9	1°	0.04 0.9
GD 60-4	6.61 168	2.94 75	4.13 105	2.68 68	2.95 75	0.56 14.1	3.83 97	9.68 246	10090 1140	15135 1710	3600	31 14.1	155.5 0.046	0.25 6.4	1°	0.04 0.9
GD 70-4	7.64 194	2.76 70	4.65 118	2.99 76	3.54 90	0.61 15.5	4.61 117	11.69 297	15932 1800	23898 2700	3000	56.4 25.6	333.9 0.098	0.27 6.9	1°	0.07 1.7
GD 80-4	8.43 214	4.33 110	5.35 136	3.50 89	4.33 110	0.81 20.6	5.10 130	13.77 350	21685 2450	32528 3675	3000	78.8 35.8	569.4 0.167	0.31 8.0	1°	0.07 1.8

Hub = Steel  
Spacer = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with standard keyways  
Weight and Moment of Inertia - Assuming maximum bores

## XGD Coupling — 4 BOLT with Shrink Disc® connection

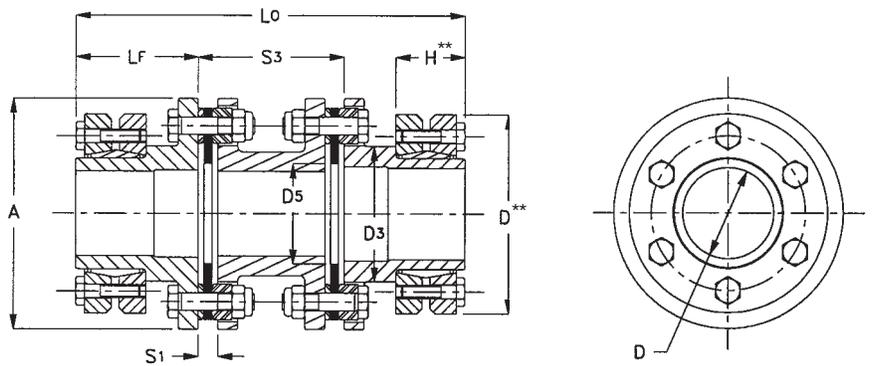


Fig. 14

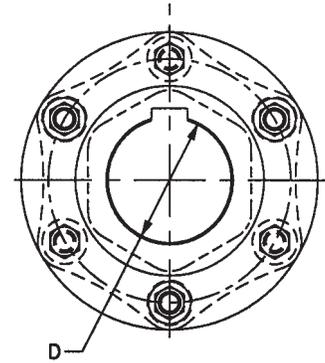
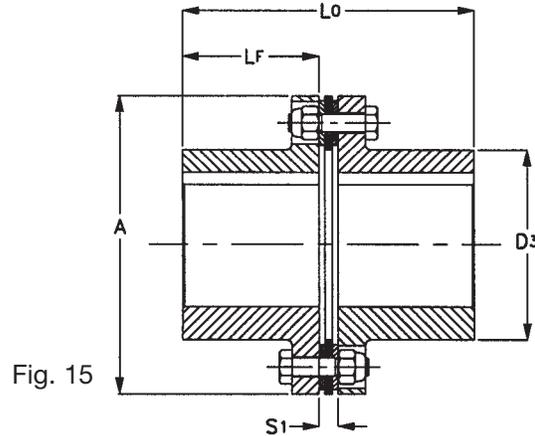
COUPLING SIZE	A	SHRINK DISC SERIES	D MAX	D <sub>3</sub>	D <sub>5</sub>	L <sub>F</sub>	S <sub>1</sub>	S <sub>3</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY	MAXIMUM TORQUE CAPACITY	MAXIMUM SPEED UNBALANCED	WEIGHT	MOMENT OF INERTIA	AXIAL MISALIGN.	ANGULAR MISALIGN.	RADIAL MISALIGN.
	(inches) (mm)	Rfn 4071 Max	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)	(rpm)	(lbs) (kg)	WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	+/- K <sub>a</sub> (inches) (mm)	K <sub>w</sub> PER DISC PACK	K <sub>r</sub> (inches) (mm)						
XGD 10-4	3.19 81	36	1.25 32	1.77 45	1.14 29	1.97 50	0.27 6.9	2.25 57	6.19 157	797 90	1196 135	4500	5.6 2.5	6.35 0.002	0.11 2.7	1°	0.03 .9
XGD 20-4	3.66 93	44	1.42 36	1.97 50	1.26 32	2.17 55	0.32 8.1	2.75 70	7.09 180	1593 180	2390 270	4300	9.0 4.1	12.3 0.004	0.12 3.0	1°	0.04 1.0
XGD 30-4	4.09 104	55	1.89 48	2.40 61	1.58 40	2.17 55	0.34 8.6	2.59 66	6.93 176	2213 250	3320 375	4200	12.1 5.5	25.1 0.007	0.15 3.7	1°	0.04 1.0
XGD 40-4	4.96 126	62	2.05 52	2.76 70	1.77 45	2.56 65	0.48 12.2	3.31 84	8.43 214	5045 570	7568 855	4000	20.2 9.2	53.9 0.016	0.17 4.2	1°	0.05 1.2
XGD 50-4	5.63 143	80*	2.76 70	3.19 81	1.97 50	2.76 70	0.50 12.7	3.64 92	9.16 233	7878 890	11817 1335	3800	33.6 15.3	129.3 0.038	0.19 4.9	1°	0.05 1.2
XGD 60-4	6.61 168	90*	2.95 75	4.13 105	2.68 68	2.95 75	0.56 14.1	3.83 97	9.68 246	10090 1140	15135 1710	3600	41.8 19.0	233.6 0.068	0.25 6.4	1°	0.06 1.4
XGD 70-4	7.64 194	90	3.35 85	4.65 118	2.99 76	3.54 90	0.61 15.5	4.61 117	11.69 297	15932 1800	23898 2700	3000	70.7 32.1	394.8 0.115	0.27 6.9	1°	0.07 1.7
XGD 80-4	8.43 214	125	3.74 95	5.35 136	3.50 89	4.33 110	0.81 20.6	5.10 130	13.77 350	21685 2450	32528 3675	3000	105.4 47.9	978.3 0.286	0.31 8.0	1°	0.07 1.8

Hub = Steel  
Spacer = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with Shrink Disc® Connection  
Weight and Moment of Inertia - Assuming maximum bores and Shrink Disc®  
\* Shrink Disc® bolts hang over hub end  
\*\* For Dimensions 'D1' and 'H' please see page 7

# SPECIFICATIONS

## HS Coupling — 6 BOLT



COUPLING SIZE	A	D MAX	D <sub>3</sub>	L <sub>F</sub>	S <sub>1</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>a</sub> (inches) (mm)	ANGULAR MISALIGN. K <sub>w</sub> (degrees)
	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)							
HS 110-6	4.33 110	1.81 46	2.56 65	1.97 50	0.33 8.40	4.27 108.4	5090 575	10180 1150	7200	5.1 2.3	10.3 0.003	0.04 1.0	1.5°
HS 132-6	5.20 132	2.36 60	3.31 84	2.36 60	0.33 8.40	5.06 128.4	9740 1100	19470 2200	5840	8.4 3.8	23.9 0.007	0.05 1.3	1.5°
HS 158-6	6.22 158	2.76 70	3.86 98	2.76 70	0.44 11.2	5.95 151.2	17700 2000	35400 4000	4920	14.1 6.4	58.1 0.017	0.06 1.5	1.5°
HS 185-6	7.28 185	3.15 80	4.41 112	3.15 80	0.55 14	6.85 174	29210 3300	58410 6600	4200	21.8 9.9	126.4 0.037	0.07 1.8	1.5°
HS 202-6	7.95 202	3.54 90	4.92 125	3.54 90	0.61 15.5	7.70 195.5	40710 4600	81430 9200	3840	29.7 13.5	208.4 0.06	0.07 1.9	1°
HS 228-6	8.98 228	3.94 100	5.51 140	3.94 100	0.69 17.5	8.56 217.5	61960 7000	123910 14000	3400	41.8 19.0	375.9 0.11	0.08 2.1	1°
HS 255-6	10.04 255	4.33 110	6.10 155	4.53 115	0.81 20.5	9.87 250.5	90280 10200	180550 20400	3080	63.8 29.0	718 0.21	0.09 2.4	1°
HS 278-6	10.94 278	4.88 124	6.85 174	4.92 125	0.83 21.2	10.68 271.2	125680 14200	251360 28400	2800	81.4 37.0	1093 0.32	0.10 2.6	1°
HS 302-6	11.89 302	5.31 135	7.48 190	5.31 135	0.96 24.4	11.59 294.4	177010 20000	354030 40000	2560	107.8 49.0	1708 0.50	0.11 2.8	1°
HS 325-6	12.80 325	5.71 145	8.07 205	5.71 145	1.02 26.0	12.44 316.0	221270 25000	442540 50000	2400	133.1 60.5	2426 0.71	0.13 3.2	1°
HS 345-6	13.58 345	6.10 155	8.54 217	6.10 155	1.11 28.2	13.31 338.2	274370 31000	548740 62000	2200	160.6 73.0	3349 0.98	0.13 3.4	1°
HS 380-6	14.96 380	6.69 170	9.37 238	6.69 170	1.26 32.0	14.65 372.0	374390 42300	748770 84600	2040	211.2 96.0	5365 1.57	0.15 3.8	1°
HS 410-6	16.14 410	7.09 180	10.04 255	7.28 185	1.31 33.2	15.87 403.2	505380 57100	1010800 114200	1880	275.0 125.0	7961 2.33	0.16 4.1	1°
HS 440-6	17.32 440	7.68 195	10.75 273	7.68 195	1.43 36.4	16.79 426.4	650350 73500	1301100 147000	1740	332.2 151.0	11344 3.32	0.17 4.4	1°
HS 475-6	18.70 475	8.27 210	11.61 295	8.27 210	1.50 38.2	18.04 458.2	814270 92000	1628500 184000	1680	420.2 191.0	16709 4.89	0.19 4.7	1°
HS 505-6	19.88 505	8.66 220	12.20 310	9.06 230	1.65 42.0	19.76 502.0	1035500 117000	2071100 234000	1520	512.6 233.0	22859 6.69	0.20 5.0	1°

Hub = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with standard keyways  
Weight and Moment of Inertia - Assuming maximum bores

# SPECIFICATIONS

## XHS Coupling — 6 BOLT with Shrink Disc® connection

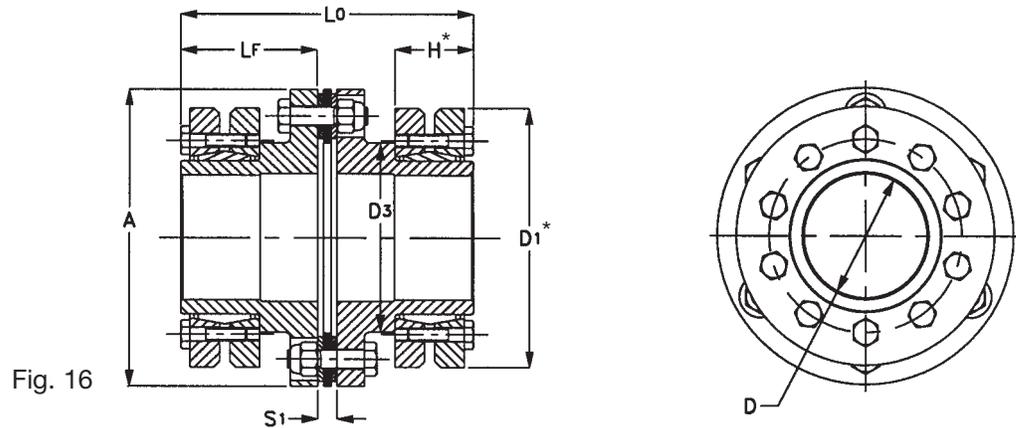


Fig. 16

COUPLING SIZE	A (inches) (mm)	SHRINK DISC SERIES Rfn 4071 MAX	D MAX (inches) (mm)	D <sub>3</sub> (inches) (mm)	L <sub>F</sub> (inches) (mm)	S <sub>1</sub> (inches) (mm)	L <sub>0</sub> (inches) (mm)	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>a</sub> (inches) (mm)	ANGULAR MISALIGN. K <sub>w</sub>
XHS 110-6	4.33 110	55	1.89 48	2.56 65	1.97 50	0.33 8.40	4.27 108.4	5090 575	10180 1150	7200	8.5 3.9	20.8 0.006	0.04 1.0	1.5°
XHS 132-6	5.20 132	80	2.76 70	3.31 84	2.36 60	0.33 8.40	5.06 128.4	9740 1100	19470 2200	5840	13.9 6.3	77.8 0.023	0.05 1.3	1.5°
XHS 158-6	6.22 158	90	2.95 75	3.86 98	2.76 70	0.44 11.2	5.95 151.2	17700 2000	35400 4000	4920	25.5 11.6	140.3 0.041	0.06 1.5	1.5°
XHS 185-6	7.28 185	100	3.15 80	4.41 112	3.15 80	0.55 14	6.85 174	29210 3300	58410 6600	4200	39.2 17.8	258.0 0.076	0.07 1.8	1.5°
XHS 202-6	7.95 202	110	3.35 80	4.92 125	3.54 90	0.61 15.5	7.70 195.5	40710 4600	81430 9200	3840	52.3 23.8	301.2 0.088	0.07 1.9	1°
XHS 228-6	8.98 228	125	3.74 95	5.51 140	3.94 100	0.69 17.5	8.56 217.5	61960 7000	123910 14000	3400	74.5 33.9	816.3 0.239	0.08 2.1	1°
XHS 255-6	10.04 255	140	4.13 105	6.10 155	4.53 115	0.81 20.5	9.87 250.5	90280 10200	180550 20400	3080	103.0 46.8	1325 0.388	0.09 2.4	1°
XHS 278-6	10.94 278	155	4.53 115	6.85 174	4.92 125	0.83 21.2	10.68 271.2	125680 14200	251360 28400	2800	142.5 64.8	2283 0.668	0.10 2.6	1°
XHS 302-6	11.89 302	175	5.31 135	7.48 190	5.31 135	0.96 24.4	11.59 294.4	177010 20000	354030 40000	2560	192.8 87.6	3885 1.137	0.11 2.8	1°
XHS 325-6	12.80 325	185	5.71 145	8.07 205	5.71 145	1.02 26.0	12.44 316.0	221270 25000	442540 50000	2400	276.0 125.4	6391 1.871	0.13 3.2	1°
XHS 345-6	13.58 345	200	6.30 160	8.54 217	6.10 155	1.11 28.2	13.31 338.2	274370 31000	548740 62000	2200	316.3 143.8	8329 2.438	0.13 3.4	1°
XHS 380-6	14.96 380	220	6.69 170	9.37 238	6.69 170	1.26 32.0	14.65 372	374390 42300	748770 84600	2040	423.7 192.6	12952 3.791	0.15 3.8	1°
XHS 410-6	16.14 410	240	7.48 190	10.04 255	7.28 185	1.31 33.2	15.87 403.2	505380 57100	1010800 114200	1880	527.3 239.7	19262 5.637	0.16 4.1	1°
XHS 440-6	17.32 440	260	8.27 210	10.75 273	7.68 195	1.43 36.4	16.79 426.4	650530 73500	1301100 147000	1740	636.4 289.3	26955 7.889	0.17 4.4	1°
XHS 475-6	18.70 475	280	9.06 230	11.61 295	8.27 210	1.50 38.2	18.04 458.2	814270 92000	1628500 184000	1680	785.3 357.0	39022 11.420	0.19 4.7	1°
XHS 505-6	19.88 505	300	9.65 245	12.20 310	9.06 230	1.65 42.0	19.76 502.0	1035500 117000	2071100 234000	1520	934.3 424.7	49753 14.560	0.20 5.0	1°

Hub = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with Shrink Disc® Connection  
Weight and Moment of Inertia - Assuming maximum bores and Shrink Disc®

\* For Dimensions 'D1' and 'H' please see page 7

# SPECIFICATIONS

## HS Coupling — 8 BOLT

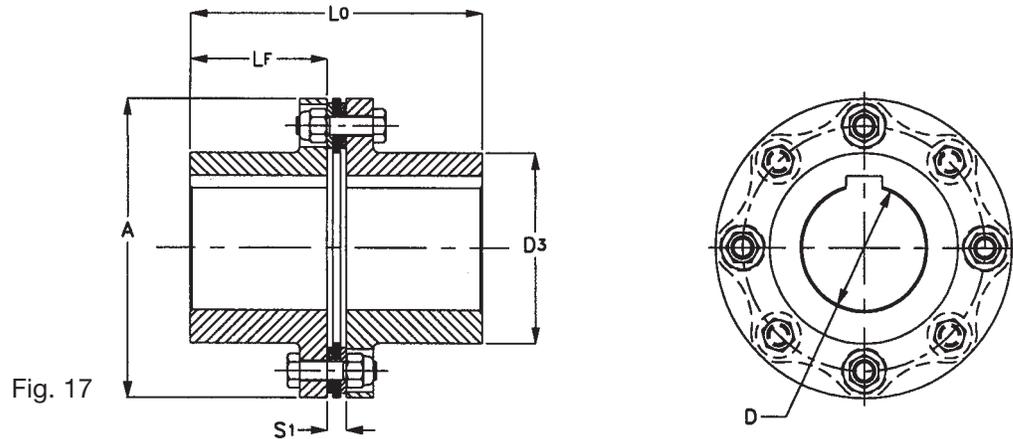


Fig. 17

COUPLING SIZE	A	D MAX	D <sub>3</sub>	L <sub>F</sub>	S <sub>1</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>a</sub> (inches) (mm)	ANGULAR MISALIGN. K <sub>w</sub>
	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)							
HS 278-8	10.94 278	4.88 124	6.85 174	4.92 125	0.83 21.2	10.68 271.2	177000 20000	354000 40000	2800	85.8 39	1189.1 0.348	0.07 1.8	0.5°
HS 302-8	11.89 302	5.31 135	7.48 190	5.31 135	0.96 24.4	11.59 294.4	266000 30000	531000 60000	2560	112.2 51	1845.1 0.540	0.08 2	0.5°
HS 325-8	12.80 325	5.71 145	8.07 205	5.71 145	1.02 26.0	12.44 316.0	327000 37000	655000 74000	2400	138.6 63	2583.2 0.756	0.08 2.1	0.5°
HS 345-8	13.58 345	6.10 155	8.54 217	6.10 155	1.11 28.2	13.31 338.2	407000 46000	814000 92000	2200	165.0 75	3519.4 1.03	0.09 2.3	0.5°
HS 380-8	14.96 380	6.69 170	9.37 238	6.69 170	1.26 32.0	14.65 372.0	558000 63000	1115000 126000	2040	222.2 101	5740.4 1.68	0.10 2.5	0.5°
HS 410-8	16.14 410	7.09 180	10.05 255	7.28 185	1.31 33.2	15.87 403.2	761000 86000	1522000 172000	1880	286.0 130	8576.4 2.51	0.11 2.7	0.5°
HS 440-8	17.32 440	7.68 195	10.75 273	7.68 195	1.43 36.4	16.79 426.4	974000 110000	1947000 220000	1740	347.6 158	12267 3.59	0.11 2.9	0.5°
HS 475-8	18.70 475	8.27 210	11.61 295	8.27 210	1.50 38.2	18.04 458.2	1221000 138000	2443000 276000	1680	440.0 200	17939 5.25	0.12 3.1	0.5°
HS 505-8	19.88 505	8.66 220	12.20 310	9.06 230	1.65 42.0	19.76 502.0	1549000 175000	3098000 350000	1520	WEIGHTS AND INERTIAS AVAILABLE UPON REQUEST	0.13 3.3	0.5°	
HS 540-8	21.26 540	9.25 235	12.99 330	9.45 240	1.81 46.0	20.71 526.0	1947000 220000	3894000 440000	1440		0.14 3.6	0.5°	
HS 570-8	22.44 570	9.84 250	13.78 350	9.84 250	2.03 51.6	21.72 551.6	2292000 259000	4585000 518000	1360		0.15 3.48	0.5°	
HS 605-8	23.82 605	10.43 265	14.57 370	10.43 265	2.09 53.2	22.96 583.2	2788000 315000	5576000 630000	1280		0.15 3.9	0.5°	
HS 635-8	25.00 635	10.83 275	15.16 385	11.02 280	2.39 60.8	24.44 620.8	3390000 383000	6780000 766000	1240		0.16 4.1	0.5°	
HS 675-8	26.57 675	11.42 290	16.14 410	11.81 300	2.57 65.2	26.19 665.2	4018000 454000	8036000 908000	1160		0.17 4.2	0.5°	
HS 700-8	27.56 700	11.81 300	16.54 420	12.40 315	2.71 68.8	27.51 698.8	4673000 528000	9346000 1056000	1120		0.17 4.4	0.5°	
HS 730-8	28.74 730	12.40 315	17.32 440	12.99 330	2.80 71.2	28.79 731.2	5381000 608000	10762000 1216000	1080		0.18 4.6	0.5°	
HS 760-8	29.92 760	12.99 330	18.11 460	13.78 350	2.87 72.8	30.43 772.8	6196000 700000	12391000 1400000	1040		0.19 4.8	0.5°	

Hub = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with standard keyways  
Weight and Moment of Inertia - Assuming maximum bores

# SPECIFICATIONS

## XHS Coupling — 8 BOLT with Shrink Disc® connection

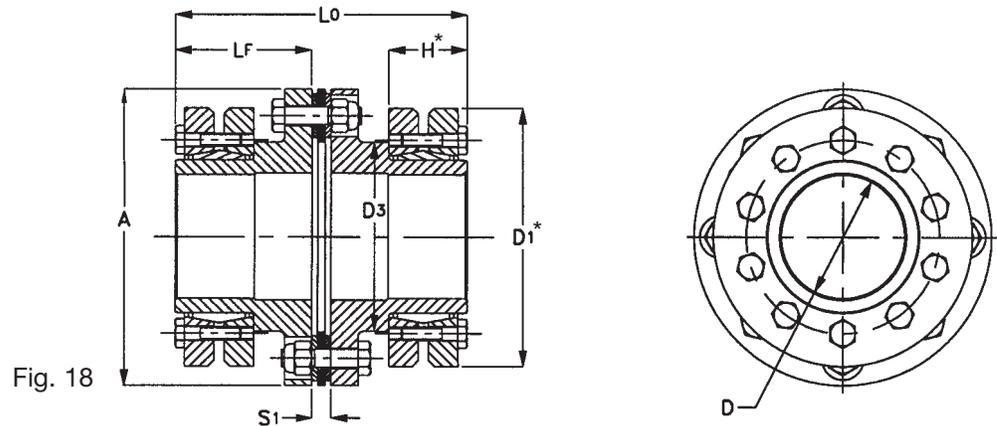


Fig. 18

COUPLING SIZE	A (inches) (mm)	SHRINK DISC SERIES Rfn 4071 MAX	D MAX (inches) (mm)	D <sub>3</sub> (inches) (mm)	L <sub>F</sub> (inches) (mm)	S <sub>1</sub> (inches) (mm)	L <sub>0</sub> (inches) (mm)	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>a</sub> (inches) (mm)	ANGULAR MISALIGN. K <sub>w</sub>
XHS 278-8	10.94 278	155	4.53 115	6.85 174	4.92 125	0.83 21.2	10.68 271.2	177000 20000	354000 40000	2800	146.9 67	2379.1 0.696	0.07 1.8	0.5°
XHS 302-8	11.89 302	175	5.31 135	7.48 190	5.31 135	0.96 24.40	11.59 294.4	266000 30000	531000 60000	2560	197.1 90	4020.7 1.177	0.08 2	0.5°
XHS 325-8	12.80 325	185	5.71 145	8.07 205	5.71 145	1.02 26.0	12.44 316.0	327000 37000	655000 74000	2400	281.5 128	6548.6 1.917	0.08 2.1	0.5°
XHS 345-8	13.58 345	200	6.30 160	8.54 217	6.10 155	1.11 28.2	13.31 338.2	407000 46000	814000 92000	2200	320.7 146	8499.6 2.49	0.09 2.3	0.5°
XHS 380-8	14.96 380	220	6.69 170	9.37 238	6.69 170	1.26 32.0	14.65 372.0	558000 63000	1115000 126000	2040	434.6 198	13328 3.90	0.10 2.5	0.5°
XHS 410-8	16.14 410	240	7.48 190	10.04 255	7.28 185	1.31 33.2	15.87 403.2	761000 86000	1522000 172000	1880	538.3 245	19876 5.82	0.11 2.7	0.5°
XHS 440-8	17.32 440	260	8.27 210	10.75 273	7.68 195	1.43 36.4	16.79 426.4	974000 110000	1947000 220000	1740	651.8 296	27877 8.16	0.11 2.9	0.5°
XHS 475-8	18.70 475	280	9.06 230	11.61 295	8.27 210	1.50 38.2	18.04 458.2	1221000 138000	2443000 276000	1680	805.1 366	40253 11.78	0.12 3.1	0.5°
XHS 505-8	19.88 505	300	9.65 245	12.20 310	9.06 230	1.65 42.0	19.76 502.0	1549000 175000	3098000 350000	1520	WEIGHTS AND INERTIAS AVAILABLE UPON REQUEST		0.13 3.3	0.5°
XHS 540-8	21.26 540	320	10.24 260	12.99 330	9.45 240	1.81 46.0	20.71 526.0	1947000 220000	3894000 440000	1440			0.14 3.6	0.5°
XHS 570-8	22.44 570	340	10.63 270	13.78 350	9.84 250	2.03 51.6	21.72 551.6	2292000 259000	4585000 518000	1360			0.15 3.8	0.5°
XHS 605-8	23.82 605	360	11.61 295	14.57 370	10.43 265	2.09 53.2	22.96 583.2	2788000 315000	5576000 630000	1280			0.15 3.9	0.5°
XHS 635-8	25.00 635	360	11.61 295	15.16 385	11.02 280	2.39 60.8	24.44 620.8	3390000 383000	6780000 766000	1240			0.16 4.1	0.5°
XHS 675-8	26.57 675	400	12.99 330	16.14 410	11.81 300	2.57 65.2	26.19 665.2	4018000 454000	8036000 908000	1160			0.17 4.2	0.5°
XHS 700-8	27.56 700	400	12.99 330	16.54 420	12.40 315	2.71 68.8	27.51 698.8	4673000 528000	9346000 1056000	1120			0.17 4.4	0.5°
XHS 730-8	28.74 730	420	13.78 350	17.32 440	12.99 330	2.80 71.2	28.79 731.2	5381000 608000	10762000 1216000	1080			0.18 4.6	0.5°
XHS 760-8	29.92 760	440	14.17 360	18.11 460	13.78 350	2.87 72.8	30.43 772.8	6196000 700000	12391000 1400000	1040			0.19 4.8	0.5°

Hub = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with Shrink Disc® Connection  
Weight and Moment of Inertia - Assuming maximum bores and Shrink Disc®

\* For Dimensions 'D1' and 'H' please see page 7

# SPECIFICATIONS

## HD Coupling — 6 BOLT

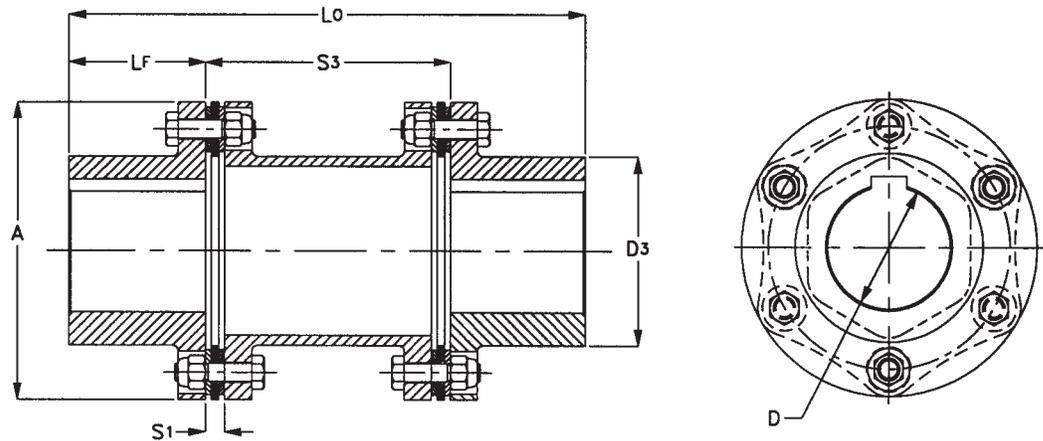


Fig. 19

COUPLING SIZE	A	D MAX	D <sub>3</sub>	L <sub>F</sub>	S <sub>1</sub>	S <sub>3</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY	MAXIMUM TORQUE CAPACITY	MAXIMUM SPEED UNBALANCED	WEIGHT	MOMENT OF INERTIA	AXIAL MISALIGN +/- K <sub>a</sub>	ANGULAR MISALIGN. K <sub>w</sub> PER DISC PACK	RADIAL MISALIGN. K <sub>R</sub>
	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)	(rpm)	(lbs) (kg)	(lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	(inches) (mm)		(inches) (mm)						
HD 110-6	4.33 110	1.81 46	2.56 65	1.97 50	0.33 8.4	3.46 88	7.40 188	5090 575	10180 1150	7200	6.4 2.9	13.7 0.004	0.08 2.1	1.5°	0.08 2.1
HD 132-6	5.20 132	2.36 60	3.31 84	2.36 60	0.33 8.4	4.25 108	8.98 228	9740 1100	19470 2200	5840	12 5.5	41.0 0.012	0.10 2.6	1.5°	0.11 2.8
HD 158-6	6.22 158	2.76 70	3.86 98	2.76 70	0.44 11.2	4.88 124	10.39 264	17700 2000	35400 4000	4920	19 8.6	85.4 0.025	0.12 3.1	1.5°	0.12 2.9
HD 185-6	7.28 185	3.15 80	4.41 112	3.15 80	0.55 14	5.51 140	11.81 300	29210 3300	58410 6600	4200	33 15	215.3 0.063	0.15 3.7	1.5°	0.13 3.3
HD 202-6	7.95 202	3.54 90	4.92 125	3.54 90	0.61 15.5	6.22 158	13.31 338	40710 4600	81430 9200	3840	46 21	375.9 0.11	0.15 3.8	1°	0.10 2.4
HD 228-6	8.98 228	3.94 100	5.51 140	3.94 100	0.69 17.5	6.85 174	14.72 374	61960 7000	123910 14000	3400	66 30	683.4 0.20	0.17 4.2	1°	0.10 2.7
HD 255-6	10.04 255	4.33 110	6.10 155	4.53 115	0.81 20.5	7.72 196	16.77 426	90280 10200	180550 20400	3080	88 40	1093 0.32	0.19 4.7	1°	0.12 3.0
HD 278-6	10.94 278	4.88 124	6.85 174	4.92 125	0.83 21.2	8.58 218	18.43 468	125680 14200	251360 28400	2800	125 57	1913 0.56	0.20 5.2	1°	0.13 3.3
HD 302-6	11.89 302	5.31 135	7.48 190	5.31 135	0.96 24.4	9.21 234	19.84 504	177010 20000	354030 40000	2560	163 74	2939 0.86	0.22 5.7	1°	0.14 3.6
HD 325-6	12.80 325	5.71 145	8.07 205	5.71 145	1.02 26.0	10.00 254	21.42 544	221270 25000	442540 50000	2400	196 89	3998 1.17	0.26 6.5	1°	0.15 3.9
HD 345-6	13.58 345	6.10 155	8.54 217	6.10 155	1.11 28.2	10.63 270	22.83 580	274370 31000	548740 62000	2200	240 109	5570 1.63	0.27 6.9	1°	0.16 4.1
HD 380-6	14.96 380	6.69 170	9.37 238	6.69 170	1.26 32.0	11.65 296	25.04 636	374390 42300	748770 84600	2040	321 146	9021 2.64	0.30 7.6	1°	0.18 4.5
HD 410-6	16.14 410	7.09 180	10.04 255	7.28 185	1.31 33.2	12.60 320	27.17 690	505380 57100	1010800 114200	1880	418 190	13804 4.04	0.32 8.2	1°	0.19 4.9
HD 440-6	17.32 440	7.68 195	10.75 273	7.68 195	1.43 36.4	13.15 334	28.50 724	650530 73500	1301100 147000	1740	493 224	18622 5.45	0.35 8.8	1°	0.20 5.1
HD 475-6	18.70 475	8.27 210	11.61 295	8.27 210	1.50 38.2	14.09 358	30.63 778	814270 92000	1628500 184000	1680	634 288	28018 8.20	0.37 9.5	1°	0.21 5.4
HD 505-6	19.88 505	8.66 220	12.20 310	9.06 230	1.65 42.0	15.51 394	33.62 854	1035500 117000	2071100 234000	1520	805 366	40866 11.96	0.40 10.1	1°	0.24 6.0

Hub = Steel  
 Spacer = Steel  
 Disc Pack = Stainless Steel  
 Hardware = Steel

Max 'D' is for bores with standard keyways  
 Weight and Moment of Inertia - Assuming maximum bores

# SPECIFICATIONS

## XHD Coupling — 6 BOLT with Shrink Disc® connection

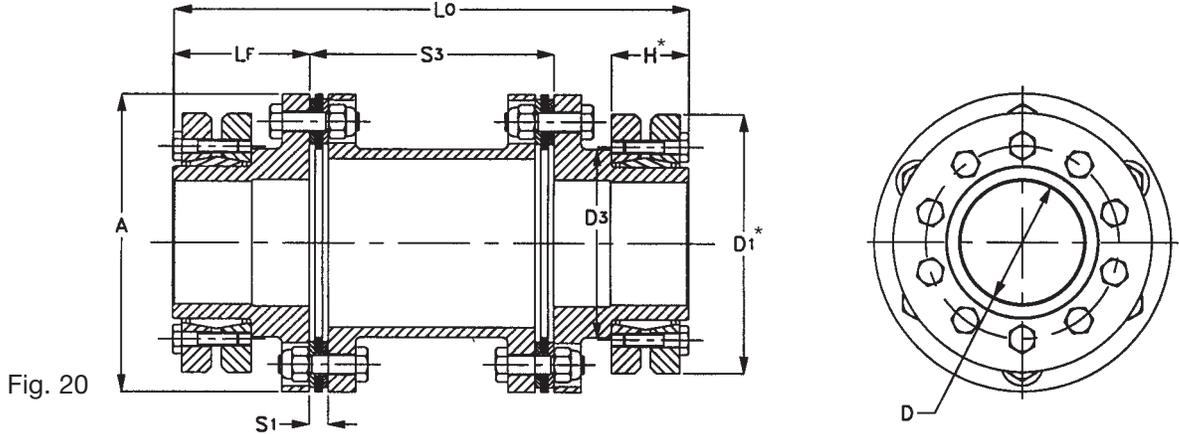


Fig. 20

COUPLING SIZE	A (inches) (mm)	SHRINK DISC SERIES Rfn 4071 MAX	D MAX (inches) (mm)	D <sub>3</sub> (inches) (mm)	L <sub>F</sub> (inches) (mm)	S <sub>1</sub> (inches) (mm)	S <sub>3</sub> (inches) (mm)	L <sub>0</sub> (inches) (mm)	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN +/- K <sub>3</sub> (inches) (mm)	ANGULAR MISALIGN. K <sub>w</sub> PER DISC PACK	RADIAL MISALIGN. K <sub>R</sub> (inches) (mm)
XHD 110-6	4.33 110	55	1.89 48	2.56 65	1.97 50	0.33 8.4	3.46 88	7.40 188	5090 575	10180 1150	7200	9.8 4.5	24.2 0.007	0.08 2.1	1.5°	0.08 2.1
XHD 132-6	5.20 132	80	2.76 70	3.31 84	2.36 60	0.33 8.4	4.25 108	8.98 228	9740 1100	19470 2200	5840	18 8.0	94.9 0.028	0.10 2.6	1.5°	0.11 2.8
XHD 158-6	6.22 158	90	2.95 75	3.86 98	2.76 70	0.44 11.2	4.88 124	10.39 264	17700 2000	35400 4000	4920	30 13.8	167.6 0.049	0.12 3.1	1.5°	0.12 2.9
XHD 185-6	7.28 185	100	3.15 80	4.41 112	3.15 80	0.55 14	5.51 140	11.81 300	29210 3300	58410 6600	4200	50 22.9	346.9 0.10	0.15 3.7	1.5°	0.13 3.3
XHD 202-6	7.95 202	110	3.35 85	4.92 125	3.54 90	0.61 15.5	6.22 158	13.31 338	40710 4600	81430 9200	3840	69 31.2	468.7 0.14	0.15 3.8	1°	0.10 2.4
XHD 228-6	8.98 228	125	3.74 95	5.51 140	3.94 100	0.69 17.5	6.85 174	14.72 374	61960 7000	123910 14000	3400	99 45.0	1124.0 0.33	0.17 4.2	1°	0.10 2.7
XHD 255-6	10.04 255	140	4.13 105	6.10 155	4.53 115	0.81 20.5	7.72 196	16.77 426	90280 10200	180550 20400	3080	127 57.7	1701 0.50	0.19 4.7	1°	0.12 3.0
XHD 278-6	10.94 278	155	4.53 115	6.85 174	4.92 125	0.83 21.2	8.58 218	18.43 468	125680 14200	251360 28400	2800	186 84.5	3103 0.91	0.20 5.2	1°	0.13 3.3
XHD 302-6	11.89 302	175	5.31 135	7.48 190	5.31 135	0.96 24.4	9.21 234	19.84 504	177010 20000	354030 40000	2560	248 113	5115 1.50	0.22 5.7	1°	0.14 3.6
XHD 325-6	12.80 325	185	5.71 145	8.07 205	5.71 145	1.02 26.0	10.00 254	21.42 544	221270 25000	442540 50000	2400	339 154	7963 2.33	0.26 6.5	1°	0.15 3.9
XHD 345-6	13.58 345	200	6.30 160	8.54 217	6.10 155	1.11 28.2	10.63 270	22.83 580	274370 31000	548740 62000	2200	296 135	10550 3.09	0.27 6.9	1°	0.16 4.1
XHD 380-6	14.96 380	220	6.69 170	9.37 238	6.69 170	1.26 32.0	11.65 296	25.04 636	374390 42300	748770 84600	2040	534 243	16609 4.86	0.30 7.6	1°	0.18 4.5
XHD 410-6	16.14 410	240	7.48 190	10.04 255	7.28 185	1.31 33.2	12.60 320	27.17 690	505380 57100	1010800 114200	1880	670 305	25104 7.35	0.32 8.2	1°	0.19 4.9
XHD 440-6	17.32 440	260	8.27 210	10.75 273	7.68 195	1.43 36.4	13.15 334	28.50 724	650530 73500	1301100 147000	1740	797 362	34232 10.0	0.35 8.8	1°	0.20 5.1
XHD 475-6	18.70 475	280	9.06 230	11.61 295	8.27 210	1.50 38.2	14.09 358	30.63 778	814270 92000	1628500 184000	1680	999 454	50332 14.7	0.37 9.5	1°	0.21 5.4
XHD 505-6	19.88 505	300	9.65 245	12.20 310	9.06 230	1.65 42.0	15.51 394	33.62 854	1035500 117000	2071100 234000	1520	1227 558	67760 1908	0.40 10.1	1°	0.24 6.0

Hub = Steel  
Spacer = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with Shrink Disc® Connection  
Weight and Moment of Inertia - Assuming maximum bores and Shrink Disc®

\* For Dimensions 'D1' and 'H' please see page 7

# SPECIFICATIONS

## HD Coupling — 8 BOLT

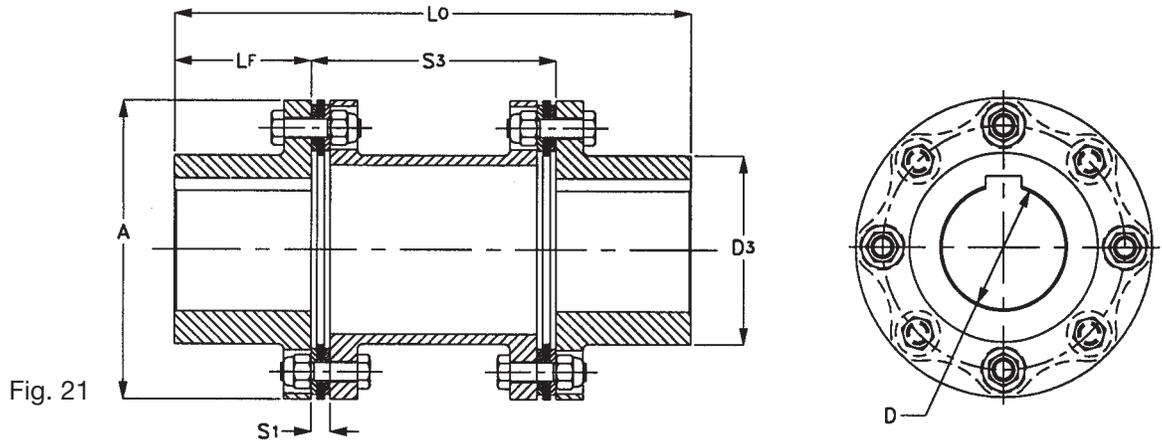


Fig. 21

COUPLING SIZE	A	D MAX	D <sub>3</sub>	L <sub>F</sub>	S <sub>1</sub>	S <sub>3</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY	MAXIMUM TORQUE CAPACITY	MAXIMUM SPEED UNBALANCED	WEIGHT	MOMENT OF INERTIA WR <sup>2</sup>	AXIAL MISALIGN +/- K <sub>a</sub>	ANGULAR MISALIGN. K <sub>w</sub> PER DISC PACK	RADIAL MISALIGN. K <sub>R</sub>
	(inches) (mm)	(in-lbs) (Nm)	(in-lbs) (Nm)	(rpm)	(lbs) (kg)	(lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	(inches) (mm)	°	(inches) (mm)						
HD 278-8	10.94 278	4.88 124	6.85 174	4.92 125	0.83 21.2	8.58 218	18.43 468	177000 20000	354000 40000	2800	129.8 59.0	1957.9 0.573	0.15 3.7	0.5°	0.07 1.7
HD 302-8	11.89 302	5.31 135	7.48 190	5.31 135	0.96 24.4	9.21 234	19.84 504	266000 30000	531000 60000	2560	169 77.0	3000.0 0.878	0.16 4	0.5°	0.07 1.8
HD 325-8	12.80 325	5.71 145	8.07 205	5.71 145	1.02 26.0	10.00 254	21.42 544	327000 37000	655000 74000	2400	202 92.0	4096.8 1.199	0.17 4.3	0.5°	0.08 2.0
HD 345-8	13.58 345	6.10 155	8.54 217	6.10 155	1.11 28.2	10.63 270	22.83 580	407000 46000	814000 92000	2200	246 112	5672.0 1.660	0.18 4.6	0.5°	0.08 2.1
HD 380-8	14.96 380	6.69 170	9.37 238	6.69 170	1.26 32.0	11.65 296	25.04 636	558000 63000	1115000 126000	2040	330 150	9276.8 2.72	0.20 5	0.5°	0.09 2.3
HD 410-8	16.14 410	7.09 180	10.04 255	7.28 185	1.31 33.2	12.60 320	27.17 690	761000 86000	1522000 172000	1880	429 195	14043.4 4.11	0.21 5.4	0.5°	0.10 2.5
HD 440-8	17.32 440	7.68 195	10.75 273	7.68 195	1.43 36.4	13.15 334	28.50 724	974000 110000	1947000 220000	1740	506 230	18930 5.54	0.23 5.8	0.5°	0.10 2.6
HD 475-8	18.70 475	8.27 210	11.61 295	8.27 210	1.50 38.2	14.09 358	30.63 778	1221000 138000	2443000 276000	1680	649 295	28428 8.32	0.25 6.3	0.5°	0.11 2.8
HD 505-8	19.88 505	8.66 220	12.20 310	9.06 230	1.65 42.0	15.51 394	33.62 854	1549000 175000	3098000 350000	1520	823 374	41447 12.13	0.26 6.7	0.5°	0.12 3.1
HD 540-8	21.26 540	9.25 235	12.99 330	9.45 240	1.81 46.0	16.38 416	35.28 896	1947000 220000	3894000 440000	1440	999 454	57301 16.77	0.28 7.2	0.5°	0.13 3.2
HD 570-8	22.44 570	9.84 250	13.78 350	9.84 250	2.03 51.6	17.72 450	37.40 950	2292000 259000	4585000 518000	1360	1177 535	75240 22.02	0.30 7.6	0.5°	0.14 3.5
HD 605-8	23.82 605	10.43 265	14.57 370	10.43 265	2.09 53.2	18.66 474	39.53 1004	2788000 315000	5576000 630000	1280	1357 617	95673 28.00	0.31 7.8	0.5°	0.14 3.7
HD 635-8	25.00 635	10.83 275	15.16 385	11.02 280	2.39 60.8	20.51 521	42.56 1081	3390000 383000	6780000 766000	1240	1602 728	125194 36.64	0.32 8.2	0.5°	0.16 4.0
HD 675-8	26.57 675	11.42 290	16.14 410	11.81 300	2.57 65.2	21.97 558	45.59 1158	4018000 454000	8036000 908000	1160	1925 875	166129 48.62	0.33 8.4	0.5°	0.17 4.3
HD 700-8	27.56 700	11.81 300	16.54 420	12.40 315	2.71 68.8	23.43 595	48.23 1225	4673000 528000	9346000 1056000	1120	2246 1021	212735 62.26	0.35 8.9	0.5°	0.18 4.6
HD 730-8	28.74 730	12.40 315	17.32 440	12.99 330	2.80 71.2	24.02 610	50.00 1270	5381000 608000	10762000 1216000	1080	2486 1130	255822 74.87	0.36 9.2	0.5°	0.19 4.7
HD 760-8	29.92 760	12.99 330	18.11 460	13.78 350	2.87 72.8	25.28 642	52.83 1342	6196000 700000	12391000 1400000	1040	2882 1310	324159 94.87	0.38 9.6	0.5°	0.20 5.0

Hub = Steel  
 Spacer = Steel  
 Disc Pack = Stainless Steel  
 Hardware = Steel

Max 'D' is for bores with standard keyways  
 Weight and Moment of Inertia - Assuming maximum bores

# SPECIFICATIONS

## XHD Coupling — 8 BOLT with Shrink Disc® connection

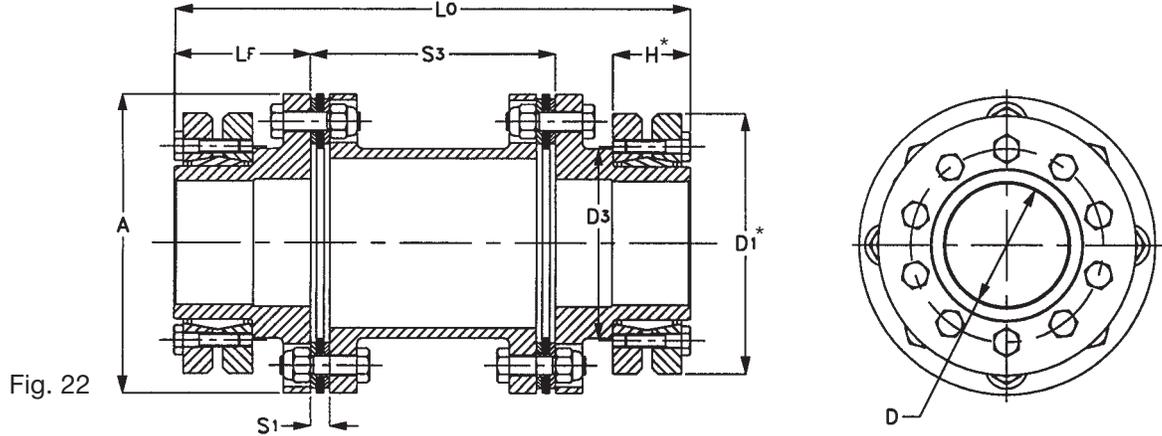


Fig. 22

COUPLING SIZE	A	SHRINK DISC SERIES Rfn 4071 MAX	D MAX	D <sub>3</sub>	L <sub>F</sub>	S <sub>1</sub>	S <sub>3</sub>	L <sub>0</sub>	NOMINAL TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM TORQUE CAPACITY (in-lbs) (Nm)	MAXIMUM SPEED UNBALANCED (rpm)	WEIGHT (lbs) (kg)	MOMENT OF INERTIA WR <sup>2</sup> (lb-in <sup>2</sup> ) (kg-m <sup>2</sup> )	AXIAL MISALIGN. +/- K <sub>s</sub> (inches) (mm)	ANGULAR MISALIGN. K <sub>w</sub> PER DISC PACK (degrees)	RADIAL MISALIGN. K <sub>r</sub> (inches) (mm)
	(inches) (mm)		(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)	(inches) (mm)								
XHD 278-8	10.94 278	155	4.53 115	6.85 174	4.92 125	0.83 21.2	8.58 218	18.43 468	177000 20000	354000 40000	2800	190.9 87	3147.9 0.921	0.15 3.7	0.5°	0.07 1.7
XHD 302-8	11.89 302	175	5.31 135	7.48 190	5.31 135	0.96 24.4	9.21 234	19.84 504	266000 30000	531000 60000	2560	253.9 115	5175.6 1.515	0.16 4	0.5°	0.07 1.8
XHD 325-8	12.80 325	185	5.71 145	8.07 205	5.71 145	1.02 26.0	10.00 254	21.42 544	327000 37000	655000 74000	2400	344.9 157	8062.2 2.360	0.17 4.3	0.5°	0.08 2.0
XHD 345-8	13.58 345	200	6.30 160	8.54 217	6.10 155	1.11 28.2	10.63 270	22.83 580	407000 46000	814000 92000	2200	410.7 187	10652.2 3.120	0.18 4.6	0.5°	0.08 2.1
XHD 380-8	14.96 380	220	6.69 170	9.37 238	6.69 170	1.26 32.0	11.65 296	25.04 636	558000 63000	1115000 126000	2040	542.4 247	16865 4.94	0.20 5	0.5°	0.09 2.3
XHD 410-8	16.14 410	240	7.48 190	10.04 255	7.28 185	1.31 33.2	12.60 320	27.17 690	761000 86000	1522000 172000	1880	681.3 310	25343 7.42	0.21 5.4	0.5°	0.10 2.5
XHD 440-8	17.32 440	260	8.27 210	10.75 273	7.68 195	1.43 36.4	13.15 334	28.50 724	974000 110000	1947000 220000	1740	810.2 368	34540 10.11	0.23 5.8	0.5°	0.10 2.6
XHD 475-8	18.70 475	280	9.06 230	11.61 295	8.27 210	1.50 38.2	14.09 358	30.63 778	1221000 138000	2443000 276000	1680	1014 461	50742 14.85	0.25 6.3	0.5°	0.11 2.8
XHD 505-8	19.88 505	300	9.65 245	12.20 310	9.06 230	1.65 42.0	15.51 394	33.62 854	1549000 175000	3098000 350000	1520	1245 566	70738 20.70	0.26 6.7	0.5°	0.12 3.1
XHD 540-8	21.26 540	320	10.24 260	12.99 330	9.45 240	1.81 46.0	16.38 416	35.28 896	1947000 220000	3894000 440000	1440	1468 667	96368 28.20	0.28 7.2	0.5°	0.13 3.2
XHD 570-8	22.44 570	340	10.63 270	13.78 350	9.84 250	2.03 51.6	17.72 450	37.40 950	2292000 259000	4585000 518000	1360	1895 861	140700 41.18	0.30 7.6	0.5°	0.14 3.5
XHD 605-8	23.82 605	360	11.61 295	14.57 370	10.43 265	2.09 53.2	18.66 474	39.53 1004	2788000 315000	5576000 630000	1280	2101 955	170303 49.84	0.31 7.8	0.5°	0.14 3.7
XHD 635-8	25.00 635	360	11.61 295	15.16 385	11.02 280	2.39 60.8	20.51 521	42.56 1081	3390000 383000	6780000 766000	1240	2327 1058	197825 57.90	0.32 8.2	0.5°	0.16 4.0
XHD 675-8	26.57 675	400	12.99 330	16.14 410	11.81 300	2.57 65.2	21.97 558	45.59 1158	4018000 454000	8036000 908000	1160	2918 1326	306346 89.66	0.33 8.4	0.5°	0.17 4.3
XHD 700-8	27.56 700	400	12.99 330	16.54 420	12.40 315	2.71 68.8	23.43 595	48.23 1225	4673000 528000	9346000 1056000	1120	3237 1471	351466 102.86	0.35 8.9	0.5°	0.18 4.6
XHD 730-8	28.74 730	420	13.78 350	17.32 440	12.99 330	2.80 71.2	24.02 610	50.00 1270	5381000 608000	10762000 1216000	1080	3576 1625	416996 122.04	0.36 9.2	0.5°	0.19 4.7
XHD 760-8	29.92 760	440	14.17 360	18.11 460	13.78 350	2.87 72.8	25.28 642	52.83 1342	6196000 700000	12391000 1400000	1040	4378 1990	573660 167.89	0.38 9.6	0.5°	0.20 5.0

Hub = Steel  
Spacer = Steel  
Disc Pack = Stainless Steel  
Hardware = Steel

Max 'D' is for bores with Shrink Disc® Connection  
Weight and Moment of Inertia - Assuming maximum bores and Shrink Disc®

\* For Dimensions 'D1' and 'H' please see page 7

# RING-flex® Coupling Installation Instructions

## TOOLS REQUIRED:

- Torque Wrench and Sockets for Shrink Disc® and Coupling Hex Bolts (see Tables 2 ,3 and 4)
- Open end wrench for Coupling Hex Bolts
- Straight Edge and/or Dial Indicator
- Feeler Gauges

THESE INSTRUCTIONS ARE FOR THE STANDARD SERIES COUPLINGS WITH NORMAL RUNNING CONDITIONS. SPECIAL COUPLING DESIGNS MAY HAVE DIFFERENT INSTRUCTIONS.

It is recommended to disassemble the coupling for easier installation. Note Figures 29-30 for the correct arrangement of the bolts, washers, disc pack, and nuts.

## Attachment to the Shaft – Shrink Disc®

1. Inspect both driving and driven shafts making sure they are clean and free from burrs. Lightly oil shaft and hub bore. **DO NOT USE MOLYKOTE OR SIMILAR LUBRICANTS.**
2. Place first hub with Shrink Disc® on one shaft and the second hub on the other shaft. Slide them back so that both shaft ends are visible.
3. Move first hub to be flush with shaft end. Gradually tighten all Shrink Disc® locking screws, in several passes, to specified tightening torque ( $M_A$ ); see Tables 2 and 3. Shrink Disc® is not fully installed until one pass is completed without any bolts turning. Use Torque Wrench! For in-depth instructions, see catalog W300.
4. Follow instructions for axial alignment and then fit second hub to shaft as explained in Step 3.

**Table 2 – Shrink Disc® Bolt Information, Low Inertia Series**

SHRINK DISC SIZE	$M_A$ (in-lbs) (Nm)	SOCKET SIZE (mm)
10	12 1.4	7
13	25 2.8	8
16	25 2.8	8
24	30 3.4	8
30	30 3.4	8
36	75 8.5	10
44	75 8.5	10
50	75 8.5	10

**Table 3 – Shrink Disc® Bolt Information**

RfN 4071 SIZE	$M_A$ (ft-lbs) (Nm)	SOCKET SIZE (mm)
24	3 4	8
30	3 4	8
36	9 12	10
44	9 12	10
50	9 12	10
55	9 12	10
62	9 12	10
68	9 12	10
75	22 30	13
80	22 30	13
90	22 30	13
100	22 30	13
110	44 60	17
125	44 60	17
140	74 100	19
155	74 100	19
165	185 251	24
175	185 251	24

RfN 4071 SIZE	$M_A$ (ft-lbs) (Nm)	SOCKET SIZE (mm)
185	185 251	24
195	185 251	24
200	185 251	24
220	185 251	24
240	362 491	30
260	362 491	30
280	362 491	30
300	362 491	30
320	362 491	30
340	362 491	30
350	362 491	30
360	362 491	30
380	620 841	36
390	620 841	36
400	620 841	36
420	620 841	36
440	620 841	36

# Installation Instructions, cont.

## Attachment to the Shaft – Bore and Keyway

1. Inspect shaft and hub bores and keyways to make sure that they are clean and free of burrs. Lightly oiling the shaft will also make it easier to assemble.
2. Place first hub on one shaft and second hub on the second shaft. Slide them until shaft ends are visible.
3. Hubs are supplied standard with a slight clearance fit. Interference fits would be recommended for bores larger than 3". For more information, please contact Ringfeder.
4. Move hubs to be flush with end of the shaft. Hubs will last longest when the key is engaged for the full length of the hub.
5. Fit key into hub and turn set screw until top of key is contacted in the hub.
6. Follow instructions for axial alignment and then secure second hub to shaft as explained in Steps 4 and 5.

## MACHINERY ALIGNMENT

The life of the coupling is directly affected by the alignment accuracy between the two coupling halves. Careful initial alignment will permit the coupling to operate at full capacity and allow for some future operational misalignments (i.e. equipment settling).

For this reason, the maximum misalignment values given in the next tables are 30% of the maximum values for the coupling. Keeping all three directions of misalignment within these limits will increase the coupling life.

### Axial Alignment

1. Bring equipment into the best visual alignment possible. Position the hubs axially so that the distance between shaft ends is within min. and max. dimensions  $S_1$  (Single Flexing) and  $S_3$  (Double Flexing) for standard couplings. See Figures 23, 24 and Table 4. For non-standard couplings, check corresponding coupling drawing.
2. Now locate first hub so that the shaft end is flush with the hub face and lock into place. Please see pertinent "Attachment to the Shaft" instructions.
3. Move second hub into position axially using the  $S_1$  (Single Flexing) or  $S_3$  (Double

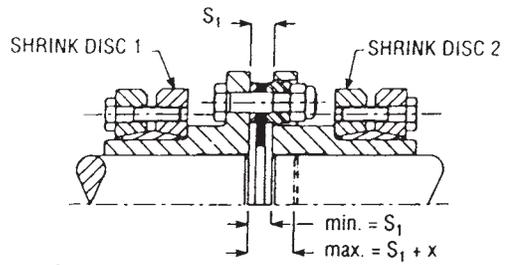


Fig. 23 Single Flexing

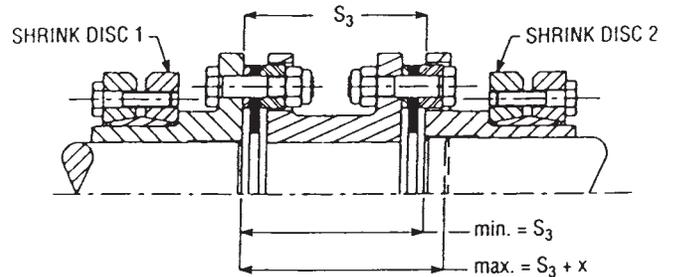


Fig. 24 Double Flexing

\* X is valid with the Shrink Disc® Shaft/Hub Connection only.

Flexing), X, and Tolerance for standard couplings. See Figures 23, 24 and Table 4.

4. Proceed with locking second hub to the shaft by following the pertinent "Attachment to the Shaft" instructions.

### Angular Alignment

1. With a dial indicator measure the angular misalignment by determining the parallelism of the coupling flange faces.
2. Dimension (U) as shown in Figure 25 should be measured in at least three points, equally spaced, to determine maximum value for (U). This must not exceed the max. allowable dimension stated in Table 4.
3. Adjust or shim equipment to bring indicator reading within max. allowable angular misalignment (U).

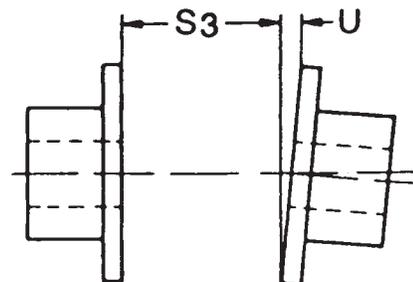


Fig. 25

## Installation Instructions, cont.

### Parallel (Radial) Alignment

1. Initial parallel alignment can be checked by using a straight-edge across the hub flanges (per Fig. 26) to measure the approx. distance ( $r$ ) as shown in Table 4 and Fig. 26.

A more precise method is using the dial indicator whereby the parallel off-set is measured in at least two places 90 degrees apart while rotating one hub. This is shown in Fig. 27.

2. Adjust or shim equipment to bring indicator reading within max. allowable parallel misalignment ( $r$ ) per Table 4.

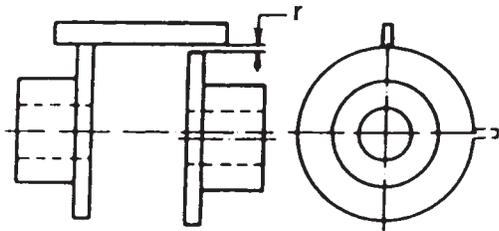


Fig. 26

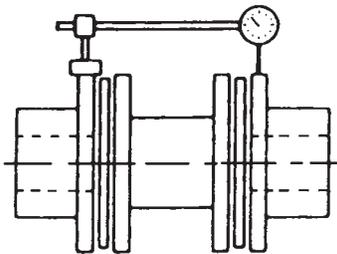


Fig. 27

### Installing Disc Pack and Sleeve

1. Once the hubs are aligned in the axial, angular and parallel directions, install the disc pack and sleeve. Figures 29 and 30 show the hardware orientation for each coupling type.

PLEASE NOTE: It is very important on the Series 'G' couplings to position the washers with the rounded face towards the disc pack.

2. At this point, the coupling bolts should be torqued to specified torque value ( $T$ ); see Table 4. A torque wrench should be used to assure proper bolt tightening.

PLEASE NOTE: With the Series 'G' coupling, it is recommended to always turn the nut and hold the bolt head.

3. It is a good practice to check the coupling alignment one last time after completing the assembly. This can be achieved by measuring the disc pack gap in 2 locations 180 degrees apart to find (2) lengths. The difference in these two measurements should not exceed ( $U$ ); see Table 4.

This completes the coupling installation.

**CAUTION:** All rotating equipment is potentially dangerous and must be properly guarded. It is the user's responsibility to check for all applicable safety codes and provide suitable guards and protection.

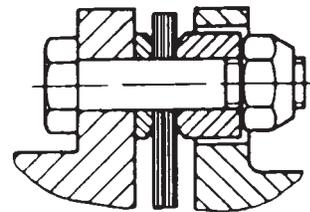


Fig. 29 G Series Hardware Arrangement

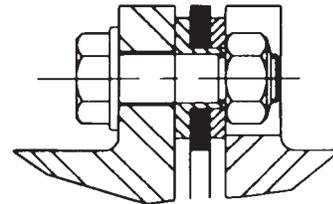


Fig. 30 H Series Hardware Arrangement

# Installation Instructions, cont.

**Table 4**

	S <sub>1</sub> (inches) (mm)	S <sub>3</sub> (inches) (mm)	X (inches) (mm)	+/- (inches) (mm)	U (inches) (mm)	r (inches) (mm)	T (ft-lbs) (Nm)	Hex or Socket Size
<b>Series G</b>	Axial Alignment				Angular	Parallel	Bolt Information	
10-4	0.27 6.9	2.25 57	0.80 20	0.02 0.5	0.02 0.4	0.01 0.2	8 11	7/16"
20-4	0.32 8.1	2.75 70	1.00 25	0.03 0.8	0.02 0.5	0.01 0.3	17 23	1/2"
30-4	0.34 8.6	2.59 66	0.80 20	0.03 0.8	0.02 0.5	0.01 0.3	17 23	1/2"
40-4	0.48 12.2	3.31 84	1.20 30	0.04 1.0	0.03 0.7	0.02 0.4	40 54	5/8"
50-4	0.50 12.7	3.64 92	1.20 30	0.05 1.3	0.03 0.7	0.02 0.4	58 79	3/4"
60-4	0.56 14.1	3.83 97	1.20 30	0.06 1.5	0.03 0.9	0.02 0.5	58 79	3/4"
70-4	0.60 15	4.59 117	1.30 33	0.07 1.8	0.04 1.0	0.02 0.5	115 156	15/16"
80-4	0.81 21	5.10 130	2.50 64	0.08 2.0	0.04 1.1	0.02 0.5	115 156	15/16"

	S <sub>1</sub> (inches) (mm)	S <sub>3</sub> (inches) (mm)	X (inches) (mm)	+/- (inches) (mm)	U (inches) (mm)	r (inches) (mm)	T (ft-lbs) (Nm)	Hex or Socket Size
<b>Series H 6 Bolt</b>	Axial Alignment				Angular	Parallel	Bolt Information	
110-6	0.30 7.6	3.46 88	0.60 15	0.02 0.5	0.03 0.9	0.02 0.6	22 30	13mm
132-6	0.33 8.40	4.25 108	0.80 20	0.02 0.5	0.04 1.0	0.03 0.8	22 30	13mm
158-6	0.44 11.2	4.88 124	1.00 25	0.03 0.8	0.05 1.2	0.04 0.9	44 60	16mm
185-6	0.55 14	5.51 140	1.20 30	0.03 0.8	0.06 1.5	0.04 1.0	74 100	18mm
202-6	0.61 15.5	6.22 158	1.30 33	0.03 0.8	0.04 1.1	0.03 0.8	111 150	21mm
228-6	0.69 17.5	6.85 174	1.50 38	0.04 1.0	0.05 1.2	0.03 0.8	170 230	24mm
255-6	0.77 19.5	7.72 196	1.80 46	0.04 1.0	0.05 1.3	0.04 0.9	332 450	30mm
278-6	0.83 21.2	8.58 218	2.00 51	0.05 1.3	0.06 1.5	0.04 1.0	332 450	30mm
302-6	0.96 24.4	9.21 234	2.10 53	0.05 1.3	0.06 1.6	0.04 1.1	443 600	32mm
325-6	1.02 26.0	10.00 254	1.90 48	0.06 1.5	0.07 1.7	0.05 1.1	443 600	32mm
345-6	1.11 28.2	10.63 270	2.30 58	0.06 1.5	0.07 1.8	0.05 1.2	575 780	36mm
380-6	1.26 32.0	11.65 296	2.20 56	0.08 2.0	0.08 2.0	0.05 1.4	811 1100	41mm
410-6	1.31 33.2	12.60 320	2.40 61	0.08 2.0	0.08 2.1	0.06 1.4	1100 1500	46mm
440-6	1.43 36.4	13.15 334	2.40 61	0.08 2.0	0.09 2.3	0.06 1.5	1475 2000	-
475-6	1.50 38.2	14.09 358	2.40 61	0.09 2.3	0.10 2.5	0.06 1.6	1900 2600	-
505-6	1.65 42.0	15.51 394	2.90 74	0.10 2.5	0.10 2.6	0.07 1.8	2400 3300	-

	S <sub>1</sub> (inches) (mm)	S <sub>3</sub> (inches) (mm)	X (inches) (mm)	+/- (inches) (mm)	U (inches) (mm)	r (inches) (mm)	T (ft-lbs) (Nm)	Hex or Socket Size
<b>Series H 8 Bolt</b>	Axial Alignment				Angular	Parallel	Bolt Information	
278-8	0.83 21.2	8.58 218	2.00 51	0.03 0.8	0.03 0.7	0.02 0.5	332 450	30mm
302-8	0.96 24.4	9.21 234	2.10 53	0.04 1.0	0.03 0.8	0.02 0.5	443 600	32mm
325-8	1.02 26.0	10.00 254	1.90 48	0.04 1.0	0.03 0.9	0.02 0.6	443 600	32mm
345-8	1.11 28.2	10.63 270	2.30 58	0.04 1.0	0.04 0.9	0.02 0.6	575 780	36mm
380-8	1.26 32.0	11.65 296	2.20 56	0.05 1.3	0.04 1.0	0.03 0.7	811 1100	41mm
410-8	1.31 33.2	12.60 320	2.40 61	0.05 1.3	0.04 1.1	0.03 0.8	1100 1500	46mm
440-8	1.43 36.4	13.15 334	2.40 61	0.05 1.3	0.05 1.2	0.03 0.8	1475 2000	-
475-8	1.50 38.2	14.09 358	2.40 61	0.06 1.5	0.05 1.2	0.03 0.8	1900 2600	-
505-8	1.65 42.0	15.51 394	2.90 74	0.06 1.5	0.05 1.3	0.04 0.9	2400 3300	-
540-8	1.81 46.0	16.38 416	3.30 84	0.07 1.8	0.06 1.4	0.04 1.0	3000 4100	-
570-8	2.03 51.6	17.72 450	3.10 79	0.07 1.8	0.06 1.5	0.04 1.1	3750 5100	-
605-8	2.09 53.2	18.66 474	3.50 89	0.07 1.8	0.06 1.6	0.04 1.1	4575 6200	-
635-8	2.39 60.8	20.51 521	4.10 104	0.08 2.0	0.07 1.7	0.05 1.2	5800 7900	-
675-8	2.57 65.2	21.97 558	4.60 117	0.08 2.0	0.07 1.8	0.05 1.3	7300 9900	-
700-8	2.71 68.8	23.43 595	5.20 132	0.08 2.0	0.07 1.8	0.05 1.4	9000 12200	-
730-8	2.80 71.2	24.02 610	5.00 127	0.09 2.3	0.08 1.9	0.06 1.4	9000 12200	-
760-8	2.87 72.8	25.28 642	5.20 132	0.09 2.3	0.08 2.0	0.06 1.5	10900 14800	-

**Table 5 – Standard Bore Tolerances**

Bore Diameter (inches) over – to	Tolerance (inches)
0.24 – 0.40	+0.0006 / -0.0
0.40 – 0.71	+0.0007 / -0.0
0.71 – 1.19	+0.0008 / -0.0
1.19 – 1.97	+0.0010 / -0.0
1.97 – 3.15	+0.0012 / -0.0
3.15 – 4.73	+0.0014 / -0.0

# TYPICAL COUPLING CONFIGURATIONS

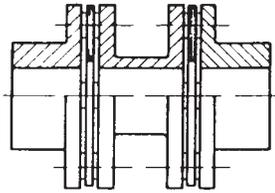


Fig. 31 Double Flexing

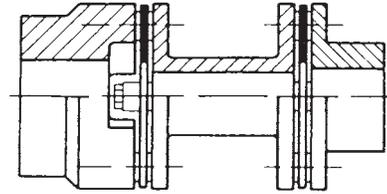


Fig. 32 Double flexing with larger hub for larger shaft diameter.

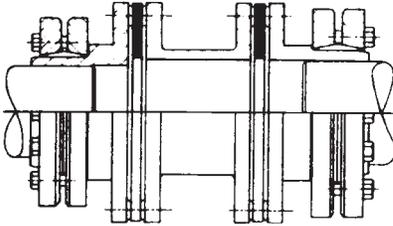


Fig. 33 Double flexing mounted with Shrink Discs® for absolutely backlash-free shaft-hub connection and axial adjustment capability.

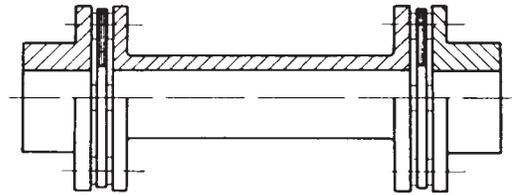


Fig. 34 Full-floating shaft coupling with tubular spacer.

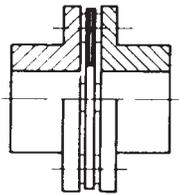


Fig. 35 Single Flexing

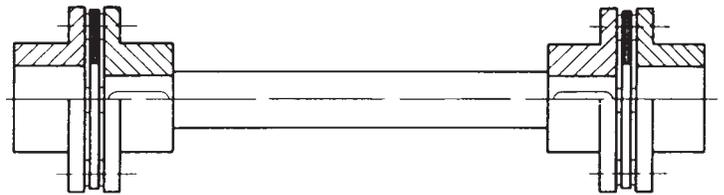


Fig. 36 2-single flexing couplings with a solid intermediate shaft.

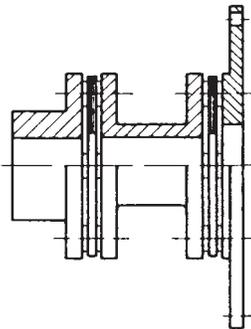


Fig. 37 Flange coupling for connection to engine fly-wheel or fluid couplings.

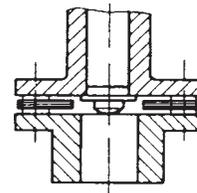


Fig. 38 Vertical installation requires a support for the weight of the spacer.

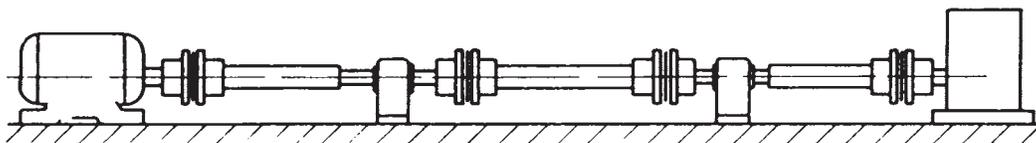


Fig. 39 Full-floating and semi-floating shaft couplings with pillow blocks to bridge large spaces between driving and driven equipment.

# MORE COUPLING CONFIGURATIONS

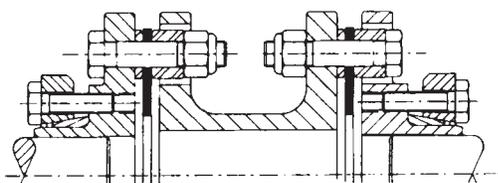


Fig. 40 Double flexing coupling mounted with Half Shrink Discs®

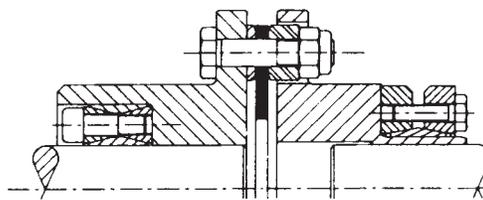


Fig. 41 Single flexing coupling mounted with one Shrink Disc® and one internal Locking Assembly.

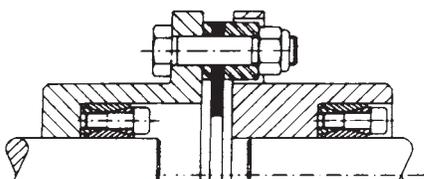


Fig. 42 Single flexing coupling fastened with two internal Locking Assemblies

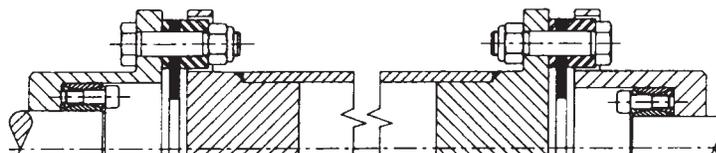


Fig. 43 Double flexing coupling with extended spacer mounted with two internal Locking Assemblies.

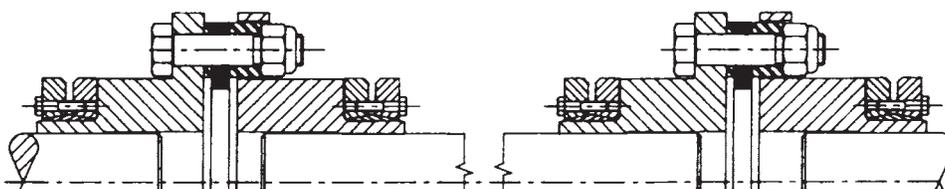


Fig. 44 Two single flexing couplings with Shrink Discs® for accommodation of varying floating shaft lengths.

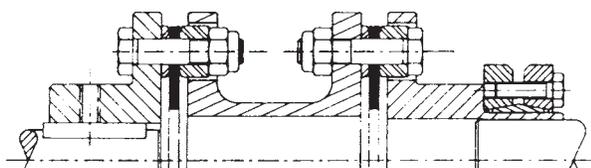


Fig. 45 Double flexing coupling fastened with a Shrink Disc® on one side and a key with a set screw on the other.

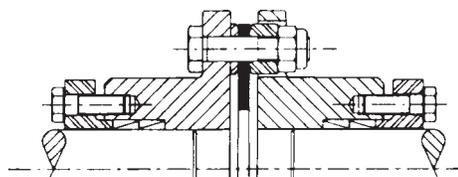


Fig. 46 Single flexing coupling fastened with Ringfeder Locking elements.

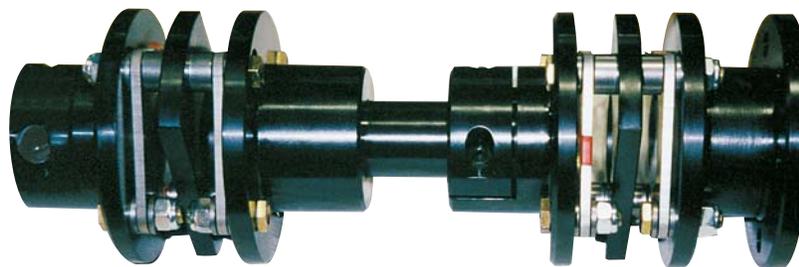


Fig. 47 Double-double flexing coupling for test stand.

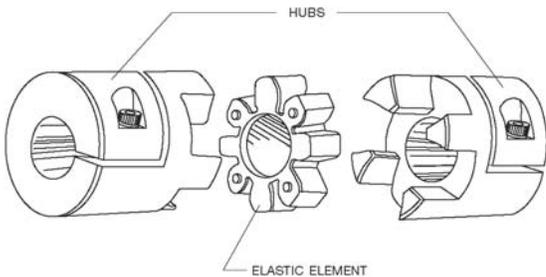
## WE ALSO OFFER: TRASCO® ES: backlash free couplings

The main design function of the TRASCO® ES coupling is to transmit motion while absorbing misalignments and vibrations, with absolute precision and without any backlash whatsoever. The very compact design makes it a very rational and functional device ideal in every positioning or feedback application.



### Description

The TRASCO® ES consists of two hubs, made of high-strength aluminum (up to the 38/45 size) or steel (from size 42) that are connected with an elastic element.



The hubs are made by accurate machining, in order to achieve accuracy, balance and optimal concentricity.

The spiders are made of a special polyurethane mixture that was developed after considerable research and laboratory testing. They are press-formed by a process which guarantees a high degree of dimensional accuracy.

The spiders are available in different hardnesses: **92 Sh. A (yellow), 98 Sh. A (red), 64 Sh. D (green), 80 Sh. A (blue).**

Coupling performance depends on the type of spider selected.

Other hardnesses are available on request to meet special operating conditions, such as higher temperatures, higher torques, and higher degree of vibration-damping capability.

### Operation

When the polyurethane element is installed in the precision machined hub it becomes precompressed, thereby providing the zero backlash feature which characterizes the transmission performance of this coupling.

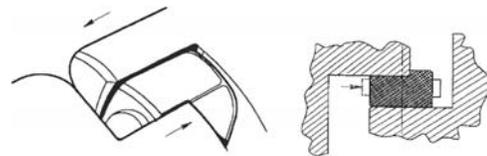
The coupling remains torsionally rigid (and backlash free) within the range of the pre-compression load, while permitting the absorption of radial, angular and axial misalignments as well as undesired vibrations.

The significantly wide pre-compressed area of the flexible element keeps the contact pressure low against the elastic element. Therefore, the spider's jaws, can be overloaded many times without losing original properties.

### Advantages

- Backlash free torque transmission
- Vibration dampening
- Low inertia
- Easy and time saving assembly
- Maintenance free
- High speed performance
- Electrical isolation

In all positioning and feedback applications, smaller TRASCO® ES couplings (up to size 19/24) replace successfully bellows, oldham, metallic beam and disc couplings. Larger TRASCO® ES couplings (from size 24/28) replace successfully metal disc, rigid, steel gear and beam coupling in spindle drives, process line drives and other high torque drive applications.



### Main applications

- Encoders
- Steppers
- Pulse generators
- Tachometers
- Medical equipment
- Robotics
- Servos
- Ball screws
- Machine tools spindles
- Process lines

### Operating Temperature Range

The recommended operating temperature range for the TRASCO® ES is **between -40 and +90°C**. Peak temperatures as high as 120°C can be tolerated.

Higher operating temperatures may cause the spider to lose a considerable amount of elasticity, thus substantially lowering the torque capacity.

**REQUEST A CATALOG TODAY!**

# RFC SPECIALTY PRODUCTS



## RfC Specialty Locking Devices

Ringfeder Corporation excels at specialty keyless shaft/hub connection solutions. From 1/4" shafts to 30" shafts, our engineers have the solution.



## BALL DETENT TORQUE LIMITERS Type BD

These accurate ball/roller and socket torque limiters are easily adjustable for different torque settings. In the event of an overload, personnel and equipment are protected as these devices disconnect mechanically and make contact with a limit switch that sounds an alarm or otherwise shuts the drive down. Available in various configurations and combinations with couplings.



## FRICTION TORQUE LIMITER Type FC

Easily adjustable, these torque limiters rely on friction to transmit the set torque. When an overload occurs, these devices slip until the overload is removed or the machine is reset. Available in various configurations and combinations with couplings.



## ARCUSAFLEX® Flywheel Couplings

Highly flexible, backlash-free, vulcanized rubber disc couplings designed to couple the flywheel of an internal combustion engine to the shaft of the driven machine. Rubber disc element accepts relatively high angular, axial and parallel misalignments. Flange dimensions according to SAE J620 standards.



## Multi Mont OCTA Flywheel Couplings

Torsionally flexible, economical flange couplings for connecting the flywheel of a combustion engine to the input shaft of a driven machine. Rubber elements dampen vibrations and accommodate misalignments.

*In accordance with our established policy to constantly improve our products, the specifications contained herein are subject to change without notice.*

*Since our Engineers cannot be aware of all applications and cannot control all the factors that may affect the function of our products, our warranty applies to our products only.*

## TECHNICAL ASSISTANCE

**Call us Toll Free at 1-800-245-2580**

Please let us know what your specific requirements are and we shall be very happy to work out detailed recommendations without any obligation. Just send a sketch with your requirements and specifications.

**Call or write for more information**  
**Visit our website: [www.ringfeder.com](http://www.ringfeder.com)**

## Our Representative:

### RINGFEDER CORPORATION

165 Carver Avenue  
P.O. Box 691  
Westwood, N.J. 07675  
TEL (201) 666-3320 • FAX (201) 664-6053

Los Angeles Office: Tel (805) 382-9900 • FAX (805) 382-9980



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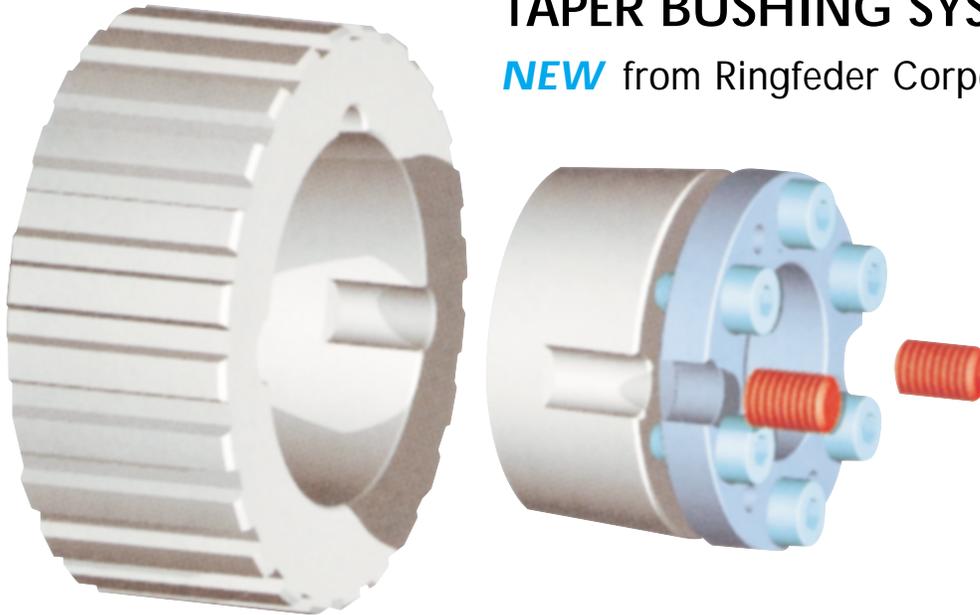
# RINGFEDER Corporation

Power Transmission Solutions

**INTRODUCING...** the next generation of taper bushing system by RFC!

## RING-lok™ TAPER BUSHING SYSTEM

**NEW** from Ringfeder Corporation.



Now have the functionality of a keyless locking device in a taper bushing system.

**NO** backlash!

**NO** keys to fit!

Works in cast iron and steel hubs, anywhere the traditional taper bushing system is used – V Belt pulleys, timing pulleys, couplings, sprockets, sheaves, etc.

Impervious to reversing loads, not susceptible to vibrating loose, the RFC RING-lok™ system is manufactured from high grade steel to exacting quality standards.

Available from stock in metric sizes (inch sizes upon request for the moment) for the taper bushing sizes listed on the left.

### TAPER BUSHING SIZES:

1108

1210

1610

2012

2517

3020

in shaft sizes from  
12mm to 70mm

# RING-lok™ DIMENSION TABLES

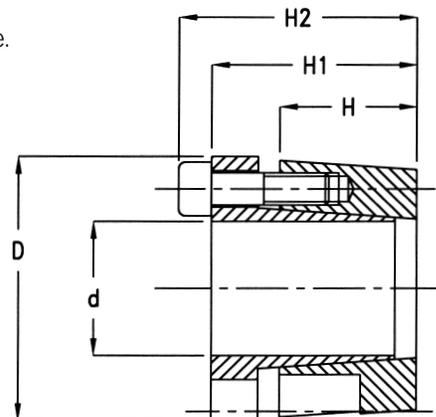
d= Nominal RING-lok™ I.D. ( Shaft O.D.)  
 D= RING-lok™ Outside Diameter  
 H= Taper Bushing Length  
 H<sub>1</sub>= Length Through Bore, Relaxed Condition  
 H<sub>2</sub>= Overall Length  
 M<sub>t</sub>= Maximum Transmissible Torque  
 P<sub>ax</sub>= Transmissible Axial Load (Thrust Capacity)  
 M<sub>a</sub>= Required Tightening Torque per Bolt  
 M<sub>s</sub>= Required Tightening Torque per Set Screw  
 S= Required Hex Key Size  
 T<sub>1</sub>= Machining Tolerances on Shaft (d)

**How to Order:** Specify RING-lok™ Type and bore.

**Example Metric:** Type 1108 with 22mm bore:  
 RL1108d22

**Example Inch:** Type 1108 with 3/4 bore  
 RL1108d0.75

**Notes:** Inch sizes only upon request



**Table 1**

RING-lok™ Type	Units	Dimensions					Bolts** Nm / lb-ft				Set Screws Nm / lb-ft			
		d max	D	H	H <sub>1</sub>	H <sub>2</sub>	Qty	Size	M <sub>a</sub>	S	Qty	Size	M <sub>s</sub>	S
1108	Metric - mm	22	39	20	29.5	33.5	6	M4	4.9	3	2	1/4	4.9	3
	Inch	0.866	1.535	0.787	1.161	1.319								
1210	Metric - mm	25	49	25	37.5	43.5	6	M6	14	5	2	3/8	14	5
	Inch	0.984	1.929	0.984	1.476	1.713								
1610	Metric - mm	35	59	25	37.5	43.5	6	M6	14	5	2	3/8	14	5
	Inch	1.378	2.323	0.984	1.476	1.713								
2012	Metric - mm	42	71	30	45.5	53.5	6	M8	25	6	2	7/16	25	6
	Inch	1.654	2.795	1.181	1.791	2.106								
2517	Metric - mm	55	86	45	60.5	68.5	6	M8	35	6	2	1/2*	35	1/4"
	Inch	2.165	3.386	1.772	2.382	2.697								
3020	Metric - mm	70	108	50	68.5	78.5	6	M10	83	8	2	5/8	83	8
	Inch	2.756	4.252	1.969	2.697	3.091								

\* All set screws Metric (BSW) except for Type 2517 which is 1/2" .

\*\* All locking bolts are Metric

## RING-lok™ 1108

Model Number	Units	Shaft Size d	Tolerance T <sub>1</sub>	Performance	
				Nm / lb-ft M <sub>t</sub>	N / lbs P <sub>ax</sub>
RL1108d12	Metric - mm	12	+0/-0.027	73	12,300
	Inch	0.472	+0/-0.0011	53.8	2,765
RL1108d14	Metric - mm	14	+0/-0.027	94	13,500
	Inch	0.551	+0/-0.0011	69.3	3,035
RL1108d15	Metric - mm	15	+0/-0.027	105	14,000
	Inch	0.591	+0/-0.0011	77.5	3,147
RL1108d16	Metric - mm	16	+0/-0.027	116	14,500
	Inch	0.630	+0/-0.0011	85.6	3,260
RL1108d18	Metric - mm	18	+0/-0.033	117	13,000
	Inch	0.709	+0/-0.0013	86.3	2,923
RL1108d19	Metric - mm	19	+0/-0.033	122	12,900
	Inch	0.748	+0/-0.0013	90.0	2,900
RL1108d20	Metric - mm	20	+0/-0.033	134	13,400
	Inch	0.787	+0/-0.0013	98.8	3,013
RL1108d22	Metric - mm	22	+0/-0.033	158	14,400
	Inch	0.866	+0/-0.0013	116.5	3,237

## RING-lok™ 1210

Model Number	Units	Shaft Size d	Tolerance T <sub>1</sub>	Performance	
				Nm / lb-ft M <sub>t</sub>	N / lbs P <sub>ax</sub>
RL1210d14	Metric - mm	14	+0/-0.027	177	25,400
	Inch	0.551	+0/-0.0011	130.6	5,710
RL1210d15	Metric - mm	15	+0/-0.027	195	26,000
	Inch	0.591	+0/-0.0011	143.8	5,845
RL1210d16	Metric - mm	16	+0/-0.027	210	26,200
	Inch	0.630	+0/-0.0011	154.9	5,890
RL1210d18	Metric - mm	18	+0/-0.033	232	25,700
	Inch	0.709	+0/-0.0013	171.1	5,778
RL1210d19	Metric - mm	19	+0/-0.033	248	26,100
	Inch	0.748	+0/-0.0013	182.9	5,868
RL1210d20	Metric - mm	20	+0/-0.033	254	25,400
	Inch	0.787	+0/-0.0013	187.4	5,710
RL1210d22	Metric - mm	22	+0/-0.033	291	26,500
	Inch	0.866	+0/-0.0013	214.7	5,958
RL1210d24	Metric - mm	24	+0/-0.033	332	27,700
	Inch	0.945	+0/-0.0013	244.9	6,228
RL1210d25	Metric - mm	25	+0/-0.033	352	28,200
	Inch	0.984	+0/-0.0013	259.6	6,340

## RING-lok™ 1610

Model Number	Units	Shaft Size	Tolerance	Performance	
		d	T <sub>1</sub>	M <sub>t</sub>	P <sub>ax</sub>
RL1610d14	Metric - mm	14	+0/-0.027	154	22,000
	Inch	0.551	+0/-0.0011	113.6	4,946
RL1610d15	Metric - mm	15	+0/-0.027	170	22,700
	Inch	0.591	+0/-0.0011	125.4	5,103
RL1610d16	Metric - mm	16	+0/-0.027	186	23,300
	Inch	0.630	+0/-0.0011	137.2	5,238
RL1610d18	Metric - mm	18	+0/-0.033	222	24,700
	Inch	0.709	+0/-0.0013	163.8	5,553
RL1610d19	Metric - mm	19	+0/-0.033	231	24,400
	Inch	0.748	+0/-0.0013	170.4	5,486
RL1610d20	Metric - mm	20	+0/-0.033	250	25,000
	Inch	0.787	+0/-0.0013	184.4	5,621
RL1610d22	Metric - mm	22	+0/-0.033	288	26,200
	Inch	0.866	+0/-0.0013	212.4	5,890
RL1610d24	Metric - mm	24	+0/-0.033	330	27,500
	Inch	0.945	+0/-0.0013	243.4	6,183
RL1610d25	Metric - mm	25	+0/-0.033	351	28,100
	Inch	0.984	+0/-0.0013	258.9	6,317
RL1610d28	Metric - mm	28	+0/-0.033	348	24,900
	Inch	1.102	+0/-0.0013	256.7	5,598
RL1610d30	Metric - mm	30	+0/-0.039	387	25,800
	Inch	1.181	+0/-0.0015	285.5	5,800
RL1610d32	Metric - mm	32	+0/-0.039	417	26,100
	Inch	1.260	+0/-0.0015	307.6	5,868
RL1610d35	Metric - mm	35	+0/-0.039	486	27,800
	Inch	1.378	+0/-0.0015	358.5	6,250

## RING-lok™ 2012

Model Number	Units	Shaft Size	Tolerance	Performance	
		d	T <sub>1</sub>	M <sub>t</sub>	P <sub>ax</sub>
RL2012d19	Metric - mm	19	+0/-0.033	303	31,900
	Inch	0.748	+0/-0.0013	223.5	7,172
RL2012d20	Metric - mm	20	+0/-0.033	327	32,700
	Inch	0.787	+0/-0.0013	241.2	7,352
RL2012d22	Metric - mm	22	+0/-0.033	375	34,100
	Inch	0.866	+0/-0.0013	276.6	7,666
RL2012d24	Metric - mm	24	+0/-0.033	424	35,400
	Inch	0.945	+0/-0.0013	312.8	7,959
RL2012d25	Metric - mm	25	+0/-0.033	451	26,100
	Inch	0.984	+0/-0.0013	332.7	5,868
RL2012d28	Metric - mm	28	+0/-0.033	480	34,200
	Inch	1.102	+0/-0.0013	354.1	7,689
RL2012d30	Metric - mm	30	+0/-0.039	500	33,300
	Inch	1.181	+0/-0.0015	368.8	7,487
RL2012d32	Metric - mm	32	+0/-0.039	520	32,500
	Inch	1.260	+0/-0.0015	383.6	7,307
RL2012d35	Metric - mm	35	+0/-0.039	595	34,000
	Inch	1.378	+0/-0.0015	438.9	7,644
RL2012d38	Metric - mm	38	+0/-0.039	680	35,800
	Inch	1.496	+0/-0.0015	501.6	8,049
RL2012d40	Metric - mm	40	+0/-0.039	742	37,100
	Inch	1.575	+0/-0.0015	547.3	8,341
RL2012d42	Metric - mm	42	+0/-0.039	808	38,500
	Inch	1.654	+0/-0.0015	596.0	8,656

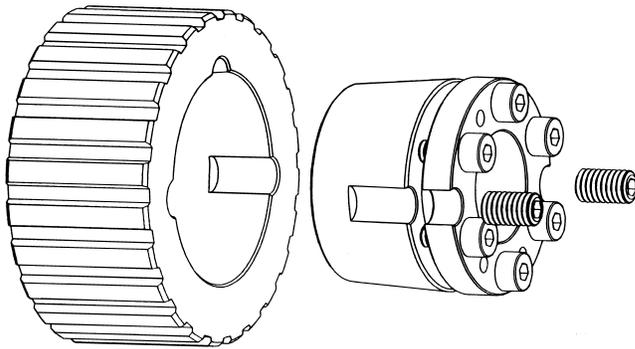
## RING-lok™ 2517

Model Number	Units	Shaft Size	Tolerance	Performance	
		d	T <sub>1</sub>	M <sub>t</sub>	P <sub>ax</sub>
RL2517d24	Metric - mm	24	+0/-0.033	516	43,000
	Inch	0.945	+0/-0.0013	380.6	9,667
RL2517d25	Metric - mm	25	+0/-0.033	548	43,900
	Inch	0.984	+0/-0.0013	404.2	9,870
RL2517d28	Metric - mm	28	+0/-0.033	642	45,900
	Inch	1.102	+0/-0.0013	473.6	10,319
RL2517d30	Metric - mm	30	+0/-0.039	717	47,800
	Inch	1.181	+0/-0.0015	528.9	10,746
RL2517d32	Metric - mm	32	+0/-0.039	760	47,500
	Inch	1.260	+0/-0.0015	560.6	10,679
RL2517d35	Metric - mm	35	+0/-0.039	892	51,000
	Inch	1.378	+0/-0.0015	658.0	11,466
RL2517d38	Metric - mm	38	+0/-0.039	920	51,800
	Inch	1.496	+0/-0.0015	678.6	11,646
RL2517d40	Metric - mm	40	+0/-0.039	950	53,200
	Inch	1.575	+0/-0.0015	700.8	11,960
RL2517d42	Metric - mm	42	+0/-0.039	978	46,600
	Inch	1.654	+0/-0.0015	721.4	10,477
RL2517d45	Metric - mm	45	+0/-0.039	1086	48,300
	Inch	1.772	+0/-0.0015	801.1	10,859
RL2517d48	Metric - mm	48	+0/-0.039	1190	49,600
	Inch	1.890	+0/-0.0015	877.8	11,151
RL2517d50	Metric - mm	50	+0/-0.046	1277	51,100
	Inch	1.969	+0/-0.0018	942.0	11,488
RL2517d55	Metric - mm	55	+0/-0.046	1454	52,900
	Inch	2.165	+0/-0.0018	1072.5	11,893

## RING-lok™ 3020

Model Number	Units	Shaft Size	Tolerance	Performance	
		d	T <sub>1</sub>	M <sub>t</sub>	P <sub>ax</sub>
RL3020d35	Metric - mm	35	+0/-0.039	1436	82,100
	Inch	1.378	+0/-0.0015	1059.2	18,458
RL3020d38	Metric - mm	38	+0/-0.039	1603	84,400
	Inch	1.496	+0/-0.0015	1182.4	18,975
RL3020d40	Metric - mm	40	+0/-0.039	1720	86,000
	Inch	1.575	+0/-0.0015	1268.7	19,335
RL3020d42	Metric - mm	42	+0/-0.039	1837	87,500
	Inch	1.654	+0/-0.0015	1355.0	19,672
RL3020d45	Metric - mm	45	+0/-0.039	2022	89,900
	Inch	1.772	+0/-0.0015	1491.5	20,211
RL3020d48	Metric - mm	48	+0/-0.039	2212	92,200
	Inch	1.890	+0/-0.0015	1631.6	20,728
RL3020d50	Metric - mm	50	+0/-0.046	2345	93,800
	Inch	1.969	+0/-0.0018	1729.8	21,088
RL3020d55	Metric - mm	55	+0/-0.046	2255	82,000
	Inch	2.165	+0/-0.0018	1663.4	18,435
RL3020d60	Metric - mm	60	+0/-0.039	2562	85,400
	Inch	2.362	+0/-0.0015	1889.8	19,200
RL3020d65	Metric - mm	65	+0/-0.046	2882	88,700
	Inch	2.559	+0/-0.0018	2125.9	19,942
RL3020d70	Metric - mm	70	+0/-0.046	3223	92,100
	Inch	2.756	+0/-0.0018	2377.4	20,706

# RING-lok™ TAPER BUSHING SYSTEM



## ASSEMBLY

**Assembly is extremely simple and fast:**

1. Couple the RING-lok™ bushing to the hub by means of the two set screws.
2. Gradually tighten the set screws, S, until the torque,  $M_S$ , is achieved (see Table 1).
3. Position the component on the shaft in the required position.
4. Then tighten the clamping screws gradually and evenly in a diametrically opposite pattern until the torque,  $M_a$ , is also reached (see Table 1).

**NOTE:** It is not necessary or advisable to lubricate the RING-lok™ bushing. NEVER use any anti-sieze lubricants on the shaft with any Ringfeder® locking devices.

## DISASSEMBLY

**To remove the RING-lok™ bushing:**

1. Loosen the tightening screws and insert them into the threaded disassembly holes.
2. Tighten the screws until the tapered bushing is released.

**To remove the bushing outer ring (if necessary):**

3. Once the inner ring is loose, loosen the two set screws.
4. Keeping the loosened set screws in place, re-position the inner bushing ring so that it is rotated 60 degrees from the original position. The inner ring flange now leans on the two set screws and the six (6) through holes in the flange are now positioned in line with the six (6) tapped holes of the outer ring.
5. Insert the screws and tighten them gradually until the outer ring is released.

*In accordance with our established policy to constantly improve our products, the specifications contained herein are subject to change without notice.*

*Since our Engineers cannot be aware of all applications and cannot control all the factors that may affect the function of our products, our warranty applies to our products only.*

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Westwood, NJ 07675

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Los Angeles Office: TEL (805) 382-9900 • FAX (805) 382-9980



# RINGFEDER

## RING-lok™ 1108

Model Number	Shaft Size In.	Tolerance In.	Performance	
	d	T <sub>1</sub>	M <sub>t</sub> Ft-Lb	P <sub>ax</sub> Lb
RL1108d 1/2	0.5000	+0/-0.0011	57	2,900
RL1108d 9/16	0.5625	+0/-0.0011	71	3,100
RL1108d 5/8	0.6250	+0/-0.0011	82	3,300
RL1108d 11/16	0.6875	+0/-0.0013	84	2,800
RL1108d 3/4	0.7500	+0/-0.0013	90	2,900
RL1108d 13/16	0.8125	+0/-0.0013	103	3,100
RL1108d 7/8	0.8750	+0/-0.0013	118	3,300

## RING-lok™ 1610

Model Number	Shaft Size In.	Tolerance In.	Performance	
	d	T <sub>1</sub>	M <sub>t</sub> Ft-Lb	P <sub>ax</sub> Lb
RL1610d 9/16	0.5625	+0/-0.0011	116	5,000
RL1610d 5/8	0.6250	+0/-0.0011	133	5,400
RL1610d 11/16	0.6875	+0/-0.0011	150	5,700
RL1610d 3/4	0.7500	+0/-0.0013	171	5,500
RL1610d 13/16	0.8125	+0/-0.0013	190	5,800
RL1610d 7/8	0.8750	+0/-0.0013	221	6,000
RL1610d 15/16	0.9375	+0/-0.0013	230	6,400
RL1610d1	1.0000	+0/-0.0013	263	6,400
RL1610d1 1/16	1.0625	+0/-0.0013	247	5,400
RL1610d1 1/8	1.1250	+0/-0.0013	262	5,700
RL1610d1 3/16	1.1875	+0/-0.0015	287	5,800
RL1610d1 1/4	1.2500	+0/-0.0015	302	6,100
RL1610d1 5/16	1.3125	+0/-0.0015	320	6,100
RL1610d1 3/8	1.3750	+0/-0.0015	336	6,400

## RING-lok™ 2517

Model Number	Shaft Size In.	Tolerance In.	Performance	
	d	T <sub>1</sub>	M <sub>t</sub> Ft-Lb	P <sub>ax</sub> Lb
RL2517d1	1.0000	+0/-0.0013	411	10,000
RL2517d1 1/16	1.0625	+0/-0.0013	436	10,700
RL2517d1 1/8	1.1250	+0/-0.0013	483	10,500
RL2517d1 3/16	1.1875	+0/-0.0015	532	10,800
RL2517d1 1/4	1.2500	+0/-0.0015	560	11,400
RL2517d1 5/16	1.3125	+0/-0.0015	584	11,100
RL2517d1 3/8	1.3750	+0/-0.0015	612	11,700
RL2517d1 7/16	1.4375	+0/-0.0015	686	12,000
RL2517d1 1/2	1.5000	+0/-0.0015	680	11,700
RL2517d1 9/16	1.5625	+0/-0.0015	709	12,200
RL2517d1 5/8	1.6250	+0/-0.0015	709	10,300
RL2517d1 11/16	1.6875	+0/-0.0015	736	10,700
RL2517d1 3/4	1.7500	+0/-0.0015	763	11,100
RL2517d1 13/16	1.8125	+0/-0.0015	820	11,100
RL2517d1 7/8	1.8750	+0/-0.0015	848	11,500
RL2517d1 15/16	1.9375	+0/-0.0015	900	11,400
RL2517d2	2.0000	+0/-0.0018	957	11,700
RL2517d2 1/16	2.0625	+0/-0.0018	987	12,000
RL2517d2 1/8	2.1250	+0/-0.0018	1,017	12,400

## RING-lok™ 1210

Model Number	Shaft Size In.	Tolerance In.	Performance	
	d	T <sub>1</sub>	M <sub>t</sub> Ft-Lb	P <sub>ax</sub> Lb
RL1210d 9/16	0.5625	+0/-0.0011	133	5,800
RL1210d 5/8	0.6250	+0/-0.0011	152	6,200
RL1210d 11/16	0.6875	+0/-0.0011	169	6,400
RL1210d 3/4	0.7500	+0/-0.0013	183	5,900
RL1210d 13/16	0.8125	+0/-0.0013	193	5,900
RL1210d 7/8	0.8750	+0/-0.0013	217	6,000
RL1210d 15/16	0.9375	+0/-0.0013	232	6,400

## RING-lok™ 2012

Model Number	Shaft Size In.	Tolerance In.	Performance	
	d	T <sub>1</sub>	M <sub>t</sub> Ft-Lb	P <sub>ax</sub> Lb
RL2012d 3/4	0.7500	+0/-0.0013	224	7,200
RL2012d 13/16	0.8125	+0/-0.0013	249	7,600
RL2012d 7/8	0.8750	+0/-0.0013	279	7,700
RL2012d 15/16	0.9375	+0/-0.0013	299	8,300
RL2012d1	1.0000	+0/-0.0013	338	6,000
RL2012d1 1/16	1.0625	+0/-0.0013	359	6,300
RL2012d1 1/8	1.1250	+0/-0.0013	361	7,800
RL2012d1 3/16	1.1875	+0/-0.0015	371	7,500
RL2012d1 1/4	1.2500	+0/-0.0015	381	7,300
RL2012d1 5/16	1.3125	+0/-0.0015	400	7,600
RL2012d1 3/8	1.3750	+0/-0.0015	419	8,000
RL2012d1 7/16	1.4375	+0/-0.0015	458	8,000
RL2012d1 1/2	1.5000	+0/-0.0015	503	8,100
RL2012d1 9/16	1.5625	+0/-0.0015	524	8,400
RL2012d1 5/8	1.6250	+0/-0.0015	565	8,600

## RING-lok™ 3020

Model Number	Shaft Size In.	Tolerance In.	Performance	
	d	T <sub>1</sub>	M <sub>t</sub> Ft-Lb	P <sub>ax</sub> Lb
RL3020d1 7/16	1.4375	+0/-0.0015	1,105	19,300
RL3020d1 1/2	1.5000	+0/-0.0015	1,186	19,000
RL3020d1 9/16	1.5625	+0/-0.0015	1,235	19,800
RL3020d1 5/8	1.6250	+0/-0.0015	1,309	20,000
RL3020d1 11/16	1.6875	+0/-0.0015	1,383	20,100
RL3020d1 3/4	1.7500	+0/-0.0015	1,473	20,000
RL3020d1 13/16	1.8125	+0/-0.0015	1,526	20,700
RL3020d1 7/8	1.8750	+0/-0.0015	1,579	21,400
RL3020d1 15/16	1.9375	+0/-0.0015	1,673	21,300
RL3020d2	2.0000	+0/-0.0018	1,536	17,000
RL3020d2 1/16	2.0625	+0/-0.0018	1,584	17,600
RL3020d2 1/8	2.1250	+0/-0.0018	1,632	18,100
RL3020d2 3/16	2.1875	+0/-0.0018	1,680	18,600
RL3020d2 1/4	2.2500	+0/-0.0018	1,728	19,200
RL3020d2 5/16	2.3125	+0/-0.0018	1,776	19,700
RL3020d2 3/8	2.3750	+0/-0.0018	1,900	19,300
RL3020d2 7/16	2.4375	+0/-0.0018	1,950	19,800
RL3020d2 1/2	2.5000	+0/-0.0018	2,000	20,300
RL3020d2 9/16	2.5625	+0/-0.0018	2,129	20,000
RL3020d2 5/8	2.6250	+0/-0.0018	2,181	20,500
RL3020d2 11/16	2.6875	+0/-0.0018	2,233	20,900
RL3020d2 3/4	2.7500	+0/-0.0018	2,284	21,400