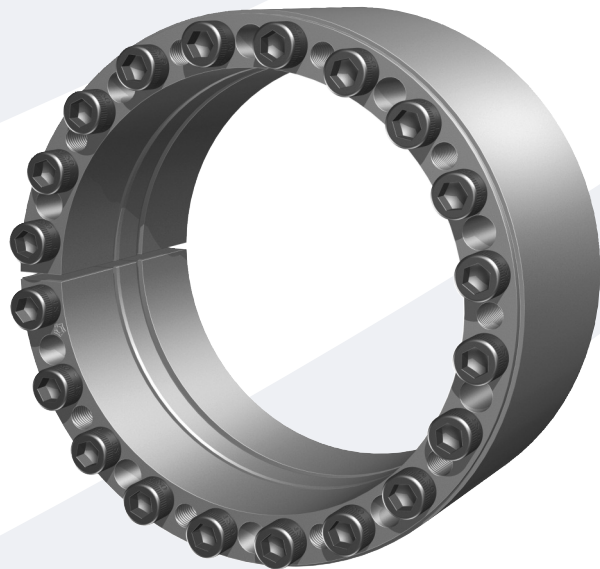
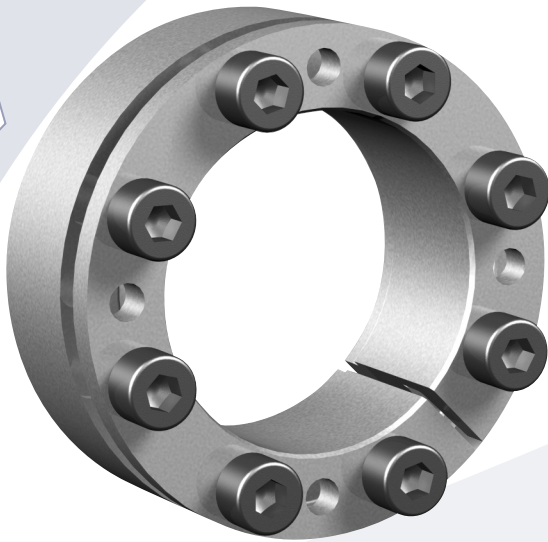


ECOLOC

by  RINGFEDER

SPECIALTY LOCKING DEVICES



ISO 9001:2000 Certified

RINGFEDER CORPORATION

Specialty Products

INTERNAL LOCKING ASSEMBLIES

SERIES RFN 7003 and 7006 – SINGLE TAPER

ADVANTAGES

- ◆ Elimination of keys, keyways or splines and fitting costs
- ◆ Reduction of machining costs
- ◆ Completely tight fit around shaft – eliminating backlash
- ◆ Not affected by reversing, dynamic or shock loads
- ◆ Easy installation, assembly and disassembly
- ◆ Transmission of high torques and axial loads
- ◆ Easy axial and angular adjustment and timing

APPLICATIONS

- ◆ Applied wherever self-centering action and good concentricity of mounted components is essential and hubs with straight-thru bores are used
-

HEAVY DUTY LOCKING ASSEMBLIES

SERIES RFN 7005 and 7009 – DOUBLE TAPER

BENEFITS

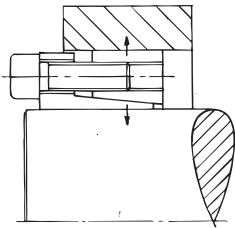
- ◆ Transmission of very high torques and axial loads
- ◆ Provide for excellent concentric fits with straight-thru hub bores – no precentering hub section needed
- ◆ Increased bending moment capacity
- ◆ Establish a mechanical, easy to install “shrink fit tight” connection between shaft and hub
- ◆ Not affected by reversing, dynamic or shock loads
- ◆ Elimination of keys, keyways or splines and fitting costs
- ◆ No stress concentrations and premature fatigue failures created by keyed connections
- ◆ Easy axial and angular adjustability for precise timing
- ◆ Reduction of machining costs

SINGLE TAPER DESIGN



SERIES RFN 7003
Straight-Thru Type

Straight-thru type is suitable for recessing inside hubs. Design allows for possible axial shifting of components relative to the shaft, so utilize this device where exact positioning is not critical.

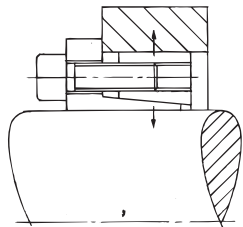


2

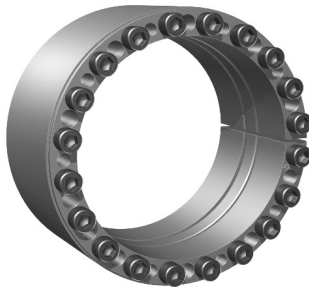


SERIES RFN 7006
Flange Type

Flange type is designed for narrow hubs and fixes the hub's position relative to the shaft. No axial shifting occurs. Liberal machining tolerances also make this device ideal for sprockets, gears and similar components.

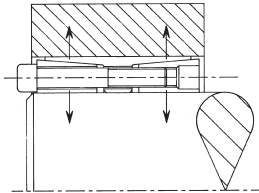


DOUBLE TAPER DESIGN



SERIES RFN 7005

The heavy duty locking assembly offers high torque transmittal in a small space. Designed for drums, larger components and heavy shock loads, this device also provides good concentricity to hubs.

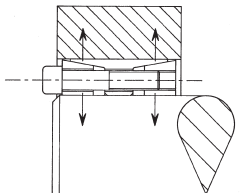


3



SERIES RFN 7009

This device is a lighter duty version for lower torque requirements without sacrificing concentricity.



Locking Assemblies SERIES RFN 7003/7006 and 7003-IN/7006-IN

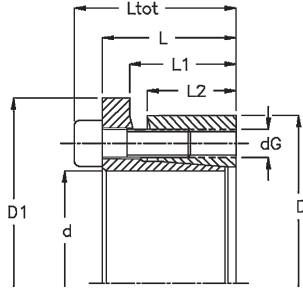


Fig. 1 Dimensions

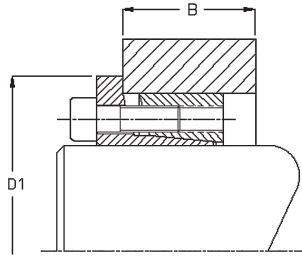


Fig. 2 Typical hub layout SERIES 7006/7006-IN
(hub axially fixed during tightening)

NOTES:
The values of T, p and p' are based on lightly oiled installation (coefficient of friction $\mu = 0.12$)
Type RFN 7006 and 7006-IN locking assemblies require a higher tightening torque than Type RFN 7003/7003-IN units to compensate for friction between locking assembly O.D. and hub bore during installation. Be sure appropriate tightening torque T_A from specification table is used.
HOW TO ORDER: Specify SIZE and SERIES
e.g. 60 x 90 / 7003
2-3/8 / 7006-IN

d = nominal locking assembly I.D.
= shaft O.D.
D = nominal locking assembly O.D.
= hub bore I.D.
 L_1 ,
 L_{tot} = width dimensions, relaxed condition

T = maximum transmissible torque
p = contact pressure between locking assembly and shaft
p' = contact pressure between locking assembly and hub bore
 T_A = required tightening torque per locking screw (tighten with torque wrench)

B = Hub width
TR = Allowable machining tolerance for shaft: use $d + 0/-TR$
for hub bore: use $D - 0/+TR$

Example: for 2" RFN 7003-IN
req'd shaft size: $2.000'' +.000/-0.002''$
req'd hub bore size: $3.150'' -.000/+ .002''$

Dimensions

Metric		Inch		RfN 7003					RfN 7006					Screws							
d	x D mm	d	x D	Ltot	L	L1	L2	TR	D1	T	Fax	T _A	p	p'	T	Fax	T _A	p	p'	dG	Qty x Size
						inches				ft-lbs	lbs	ft-lbs	psi	psi	ft-lbs	lbs	ft-lbs	psi	psi		
19	x 47	3/4	x 1.850	1.339	1.102	0.866	0.669	0.0015	2.205	213	6837	10	33366	14433	199	6390	13	31184	13489		5 x M6
20	x 47	—	—	1.339	1.102	0.866	0.669	0.0015	2.205	221	6736	10	33366	14433	207	6295	13	31184	13489		5 x M6
22	x 47	7/8	x 1.850	1.339	1.102	0.866	0.669	0.0015	2.205	245	6779	10	30418	14433	229	6336	13	28428	13489		5 x M6
24	x 50	—	—	1.339	1.102	0.866	0.669	0.0015	2.323	316	8019	10	33366	16606	295	7494	13	31184	15519		6 x M6
25	x 50	1	x 1.969	1.339	1.102	0.866	0.669	0.0015	2.323	347	8468	10	32590	16606	325	7914	13	30458	15519		6 x M6
28	x 55	1 1/8	x 2.165	1.339	1.102	0.866	0.669	0.0015	2.520	387	8420	10	30418	15209	361	7869	13	28428	14214		6 x M6
30	x 55	1 3/16	x 2.165	1.339	1.102	0.866	0.669	0.0015	2.520	418	8500	10	28866	15209	391	7944	13	26977	14214		6 x M6
32	x 60	1 1/4	x 2.362	1.339	1.102	0.866	0.669	0.0015	2.717	592	11276	10	32590	17382	553	10538	13	30458	16244		8 x M6
35	x 60	1 3/8	x 2.362	1.339	1.102	0.866	0.669	0.0015	2.717	647	11272	10	28866	17382	605	10534	13	26977	16244		8 x M6
—	—	1 7/16	x 2.559	1.339	1.102	0.866	0.669	0.0015	2.913	671	11200	10	30728	17071	627	10468	13	28718	15954		8 x M6
38	x 65	1 1/2	x 2.559	1.339	1.102	0.866	0.669	0.0015	2.913	699	11216	10	29503	16991	656	10531	13	27703	15954		8 x M6
40	x 65	—	—	1.339	1.102	0.866	0.669	0.0015	2.913	738	11253	10	28731	16991	693	10567	13	26977	15954		8 x M6
42	x 75	1 5/8	x 2.953	1.614	1.299	0.984	0.787	0.0015	3.307	1257	18243	26	37227	20390	1180	17129	30	34955	19145		7 x M8
45	x 75	1 3/4	x 2.953	1.614	1.299	0.984	0.787	0.0015	3.307	1351	18303	26	34755	20390	1269	17186	30	32634	19145		7 x M8
—	—	1 7/8	x 3.150	1.614	1.299	0.984	0.787	0.0015	3.504	1414	18099	26	33245	19617	1328	16994	30	31216	18420		7 x M8
50	x 80	1 15/16	x 3.150	1.614	1.299	0.984	0.787	0.0015	3.504	1485	18101	26	31666	19617	1394	16996	30	29733	18420		7 x M8
—	—	2	x 3.150	1.614	1.299	0.984	0.787	0.0020	3.504	1485	17816	26	31167	19617	1394	16729	30	29265	18420		7 x M8
—	—	2 1/8	x 3.346	1.614	1.299	0.984	0.787	0.0020	3.701	1846	20849	26	33054	20390	1733	19577	30	31037	19145		8 x M8
55	x 85	2 3/16	x 3.346	1.614	1.299	0.984	0.787	0.0020	3.701	1885	20896	26	32438	20390	1770	19621	30	30458	19145		8 x M8
—	—	2 1/4	x 3.543	1.614	1.299	0.984	0.787	0.0020	3.898	1980	21115	26	30164	18845	1859	19827	30	28323	17695		8 x M8
60	x 90	2 3/8	x 3.543	1.614	1.299	0.984	0.787	0.0020	3.898	2082	21150	26	28731	18845	1955	19859	30	26977	17695		8 x M8
—	—	2 7/16	x 3.740	1.614	1.299	0.984	0.787	0.0020	4.094	2380	23436	26	31785	20390	2235	22005	30	29846	19145		9 x M8
—	—	2 1/2	x 3.740	1.614	1.299	0.984	0.787	0.0020	4.094	2443	23453	26	30991	20390	2294	22022	30	29099	19145		9 x M8
65	x 95	2 9/16	x 3.740	1.614	1.299	0.984	0.787	0.0020	4.094	2506	23501	26	30276	20390	2353	22067	30	28428	19145		9 x M8
—	—	2 11/16	x 4.331	1.969	1.575	1.181	0.945	0.0020	4.685	3755	33532	52	34055	21162	3526	31486	61	31976	19870		8 x M10
70	x 110	2 3/4	x 4.331	1.969	1.575	1.181	0.945	0.0020	4.685	3857	33589	52	33211	21162	3622	31539	61	31184	19870		8 x M10
—	—	2 7/8	x 4.528	1.969	1.575	1.181	0.945	0.0020	4.882	3936	32853	52	30936	19617	3695	30848	61	29048	18420		8 x M10
75	x 115	2 15/16	x 4.528	1.969	1.575	1.181	0.945	0.0020	4.882	4046	32882	52	30121	19617	3799	30875	61	28283	18420		8 x M10
80	x 120	3	x 4.724	1.969	1.575	1.181	0.945	0.0020	5.079	4313	32862	52	28577	18845	4049	30857	61	26832	17695		8 x M10
—	—	3 1/4	x 4.921	1.969	1.575	1.181	0.945	0.0025	5.276	5043	37242	52	31015	20390	4735	34969	61	29122	19145		9 x M10
85	x 125	3 3/8	x 4.921	1.969	1.575	1.181	0.945	0.0025	5.276	5200	37295	52	30121	20390	4883	35019	61	28283	19145		9 x M10
—	—	3 7/16	x 5.118	1.969	1.575	1.181	0.945	0.0025	5.472	5302	37021	52	29456	19617	4979	34761	61	27658	18420		9 x M10
90	x 130	3 1/2	x 5.118	1.969	1.575	1.181	0.945	0.0025	5.472	5467	37032	52	28577	19617	5134	34772	61	26832	18420		9 x M10
95	x 135	3 3/4	x 5.315	1.969	1.575	1.181	0.945	0.0025	5.669	6434	41283	52	30121	21162	6041	38764	61	28283	19870		10 x M10
100	x 145	3 15/16	x 5.709	2.205	1.732	1.260	1.024	0.0025	6.063	7934	48366	92	31666	22398	7450	45414	107	29733	21031		8 x M12
—	—	4	x 5.709	2.205	1.732	1.260	1.024	0.0025	6.063	8052	48311	92	31167	22398	7560	45362	107	29265	21031		8 x M12
110	x 155	4 7/16	x 6.102	2.205	1.732	1.260	1.024	0.0025	6.457	8641	47887	92	29349	20853	8114	44964	107	27558	19580		8 x M12
120	x 165	4 3/4	x 6.496	2.205	1.732	1.260	1.024	0.0025	6.850	10683	54272	92	31666	21934	10031	50959	107	29733	20596		9 x M12
—	—	4 15/16	x 7.087	2.520	2.047	1.575	1.339	0.0025	7.441	14258	69303	92	29782	21162	13387	65073	107	27964	19870		12 x M12
130	x 180	5	x 7.087	2.520	2.047	1.575	1.339	0.0025	7.441	14925	69988	92	28731	21162	14014	65717	107	26977	19870		12 x M12
140	x 190	5 7/16	x 7.480	2.677	2.126	1.575	1.339	0.0025	7.835	17125	74567	140	27341	19617	16080	70016	170	25672	18420		9 x M14
150	x 200	5 15/16	x 7.480	2.677	2.126	1.575	1.339	0.0025	8.228	20110	81727	140	28577	21162	18883	76739	170	26832	19870		10 x M14
160	x 210	—	—	2.677	2.126	1.575	1.339	0.0025	8.622	20503	78115	140	27341	20853	19251	73348	170	25672	19580		11 x M14
170	x 225	6 7/16	x 8.858	3.071	2.520	1.969	1.732	0.0025	9.213	23802	85351	140	21625	16219	22349	80142	170	20306	15229		12 x M14
180	x 235	6 15/16	x 9.252	3.071	2.520	1.969	1.732	0.0030	9.606	25137	85132	140	20853	16219	23603	79936	170	19580	15229		12 x M14
190	x 250	7 7/16	x 9.843	3.071	2.520	1.969	1.732	0.0030	10.197	35181	112877	140	23055	17676	33190	106487	170	21750	16675		15 x M14
200	x 260	7 15/16	x 9.252	3.071	2.520	1.969	1.732	0.0030	10.591	37757	115084	140	20755	16143	35620	108570	170	19580	15229		15 x M14

Step 1:

Determine shaft diameter (d) to be used or max. torque (T) to be transmitted.

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

Note: For hollow shaft applications please consult with us.

Step 2:

Select a locking assembly for the determined shaft dia. (d) from specification tables and check if corresponding max. transmissible torque (T) meets the torque requirement.

If, however, torque is the primary requirement, then select the needed torque (T) from same specification tables and find the corresponding shaft diameter (d).

Note: Required peak torque should never exceed specified transmissible torque (T).

Step 3:

Determine required hub outside dia. (D_N) for selected locking assembly from table on page 11 or calculate it by using the following equation:

Hub Calculation:

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

- YP = yield point of hub material (lbs/sq.in.)
- p' = contact pressure between locking assembly and hub; see specification tables.
- C₃ = stress reduction factors, depending on hub width (B)
 - = 0.6 if hub width B ≥ 2*L2
 - = 0.8 when using two (2) or more units with B ≥ L (1 + n); n = number of units
 - = 1.0 for B = L2

Step 4:

Applicable machining tolerances (TR) for shaft and hub bore are shown in specification tables.

Step 5:

Specify and order selected locking assembly.

WHENEVER IN DOUBT, CONSULT US!

Installation and Removal Instructions: Type 7003 and 7006

INSTALLATION

Since the torque is transmitted by contact pressure and friction between functional surfaces, condition of contact surfaces and proper tightening of the locking screws are important. Locking Assemblies are supplied ready for installation.

1. Check if all contact surfaces, including screw threads and screw head bearing surfaces are clean and lightly oiled. If not, lightly oil these parts.
Do Not Use Molybdenum Disulfide, "Molykote" or any other similar lubricants.
2. Back-off all locking screws by at least two turns. Take out 3 or 4 equally spaced screws and insert them into adjacent push-off threads after first removing the protective plastic caps (if included). Turn them in hand tight until they make contact with part (b), see Fig. 3. This will keep parts (a) and (b) spaced apart for easy insertion of Locking Assembly into the hub bore, as illustrated in Fig. 3.
3. Slide Locking Assembly onto the shaft and into the hub bore and bring them to desired position.
4. Remove the locking screws separating parts (a) and (b) and return them to their original holes and cover again the tapped holes with the plastic caps (if included).
5. Tighten locking screws gradually and in several stages to specified tightening torque (T_A) using diametrically opposite tightening sequence, however, with following **exception**: The two screws adjacent to the slit in part (a) should be torqued one after the other to avoid possible distortion of the flange, see Fig. 4.

6. After completing installation, check locking screws again in a clockwise or counter-clockwise sequence and make sure none of the bolts can be turned at specified tightening torque. It is not necessary to recheck tightening torque after equipment has been in operation.

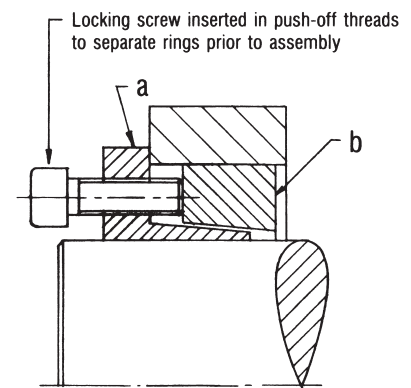


Fig. 3

NOTE: SERIES RFN 7006 AND 7006-IN Locking Assemblies require a higher tightening torque than Series RFN 7003 and 7003-IN units in order to compensate for friction between O.D. of part (b) and hub bore during installation. Make sure correct tightening torque (T_A) per specification table is applied.

REMOVAL

1. Loosen all screws a few turns.
2. Remove plastic caps in part (a) (if included) and transfer screws to all push-off threads.
3. To release connection, progressively tighten these screws in diametrically opposite sequence except the two (2) screws adjacent to the slit, which must be tightened one after the other.
4. Remove Locking Assembly.

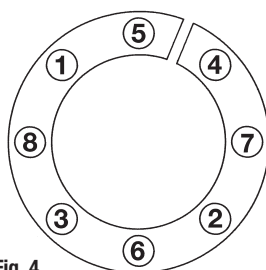


Fig. 4

Tightening torques (T_A) in lb-ft for Locking Screws DIN 912-12.9

Screw Size	M6	M8	M10	M12	M14	M16	M18	M20	M22
Hex key Size (mm)	5	6	8	10	12	14	14	17	17
SERIES 7003 & 7003-IN	10	26	51	89	140	218	299	428	575
SERIES 7006 & 7006-IN	13	30	61	107	170	262	358	509	686

Heavy Duty Locking Assemblies SERIES RFN 7005 & 7009

DESIGN CHARACTERISTICS

These Locking Assemblies are of double taper design with self-locking tapers and an integral pre-centering section. As the locking screws are torqued up, the tapered rings are pulled towards each other translating the screw clamp forces into predictable, radial contact pressures on shaft and hub bore creating a mechanical shrink fit.

In contrast to conventional interference or shrink fits, the Locking Assemblies are installed with initial clearance fits assuring easy installation, axial and radial adjustments.

The wide design of these units offers greater torque and bending moment capacities and provides good pre-centering characteristics in straight-thru bore installations with excellent concentricity.

SELECTION GUIDE

Step 1:

Determine shaft diameter (d) to be used or max. torque (T) to be transmitted.

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

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

$$T_{\text{res}} = \sqrt{T^2 + \left(\frac{F_{\text{ax}} \times d}{24}\right)^2} \leq T_{\text{cat}}$$

T_{res} = resultant torque to be transmitted (ft-lbs)

T = actual or max. torque to be transmitted (ft-lbs)

F_{ax} = axial load/thrust to be transmitted (lbs)

d = shaft diameter (inches)

T_{cat} = max. transmissible torque (ft-lbs) of a locking assembly as specified

NOTE: For hollow shaft applications please consult with us.

Step 2:

Select a Locking Assembly for the determined shaft dia. (d) from specification tables and check if corresponding max. transmissible torque (T) meets the torque requirement.

If, however, torque is the primary requirement, then select the needed torque (T) from same specification tables and find the corresponding shaft diameter (d).

NOTE: Required peak torque should never exceed specified transmissible torque (T).

Step 3:

Determine recommended min. hub outside dia. (D_N) for locking assembly selected from specification tables or calculate hub outside diameter (D_N) by using the following equation:

Hub Calculation:

$$D_N = D \times \sqrt{\frac{YP + (C_3 \times p')}{YP - (C_3 \times p')}}}$$

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

p' = contact pressure between locking assembly and hub, see specification tables.

B = Hub width

D_N = required hub O.D.

C_3 = stress reduction factors, depending on hub width (B)

$C_3 = 0.6$ if hub width $B = 2L_1$

$C_3 = 0.8$ if $B = 1.5 L_1$ or with two or more units and $B = L_3 (1 + n)$; n = number of units

$C_3 = 1.0$ for $B = L_1$

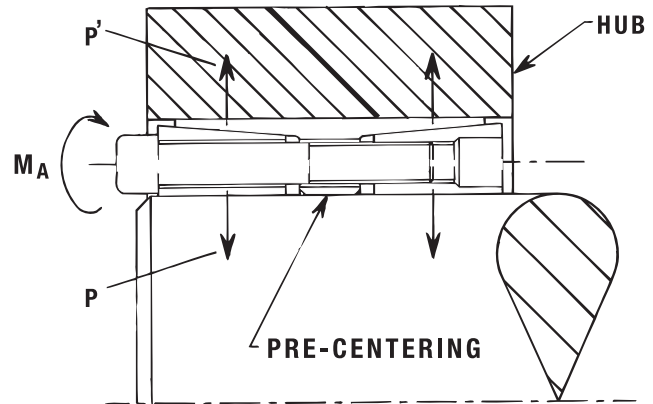


Fig. 5 SERIES RFN 7005/7009 Locking Assemblies

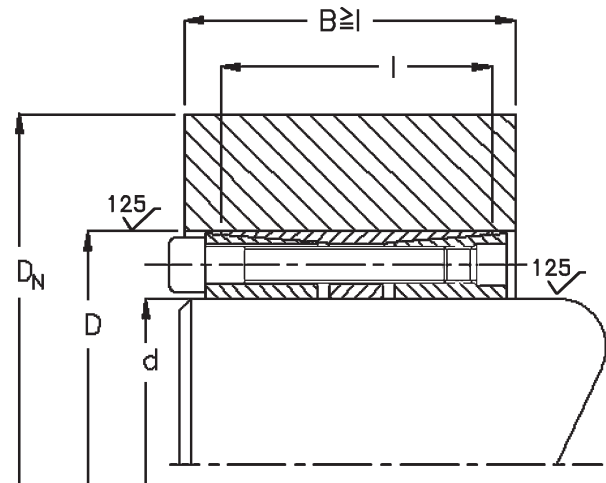


Fig. 6 Typical Hub Layout

Step 4:

Applicable machining tolerances (TR) for shaft and hub bore are shown in specification tables.

Required surface finish for shaft and hub bores: **RMS 125 or better**

Step 5:

Ordering Example:

Specify: SIZE and SERIES

METRIC Example: 100 x 145 RFN 7005

INCH Example: 3 ¹⁵/₁₆ RFN 7005-IN

BENDING MOMENTS

Although these Locking Assemblies are designed to transmit very high torques and axial loads, they are also capable to transmit bending moments.

For applications where bending moments need to be considered, please contact us for assistance.

Whenever in doubt, consult with us!

For LOCKING ASSEMBLIES RFN 7005, 7009

INSTALLATION

Since the torque is transmitted by contact pressure and friction between functional surfaces, condition of contact surfaces and proper tightening of the locking screws is important. Locking Assemblies are supplied ready for installation.

1. All contact surfaces, including screw threads and screw head bearing surfaces should be clean and lightly oiled. If not, lightly oil these parts.

Do Not Use Molybdenum Disulfide, "Molykote" or any other similar lubricants.

2. Back-off all locking screws by at least two turns. Take out at least 3 equally spaced screws and insert them into adjacent push-off threads in front thrust ring ③ and outer ring ② as shown in Fig. 7. This procedure will keep the tapers apart for easy installation of the locking assembly. If the holes are covered with protective plastic caps remove them first, of course.

3. Place locking assembly on shaft and into hub bore to desired position. Remove the screws from the push-off threads and screw them back into the original threaded holes of the rear thrust ring ① as shown in Fig. 8.

4. Tighten locking screws evenly in several stages to specified tightening torque (T_A), listed in table below or specification tables. Use diametrically opposite tightening sequence, however, with following exception: The two screws adjacent to the slit should be torqued one after the other to avoid possible distortion of the thrust rings, see Fig. 9.

NOTES

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

5. After completing the final pass, it is important to make sure that the torque wrench is set at specified tightening torque (T_A). Now check all locking screws in clockwise or counter-wise sequence. If no screw can be turned any more, the installation is finished. There is no need to recheck tightening torque after equipment has been in operation.

NOTE

Used Locking Assemblies must be cleaned, lightly oiled and re-assembled as shown in Fig. 8. That means the slits of the front ③ and rear ① thrust rings as well as the outer ring ② have to be lined up and the clearance holes of the front and outer ring must be opposite the threaded holes of the rear thrust ring.

REMOVAL

1. Loosen all screws a few turns.
2. Remove plastic caps located in front thrust ring ③ (if included) and transfer the locking screws into all push-off threads provided in front thrust ring ③ and outer ring ② as shown in Fig. 7.
3. To release connection, progressively tighten all screws in diametrically opposite sequence except the two (2) screws adjacent to the slit, which must be tightened one after the other.
4. Remove Locking Assembly.

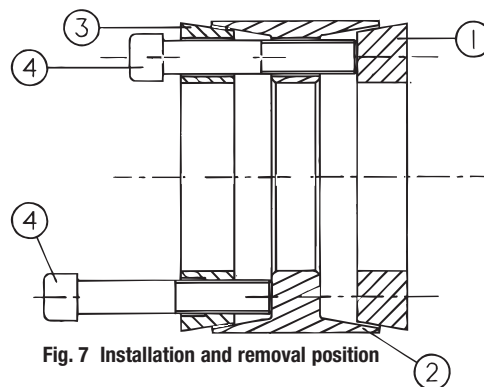


Fig. 7 Installation and removal position

- 1 = Rear thrust ring
- 2 = Outer ring
- 3 = Front thrust ring
- 4 = Locking screw

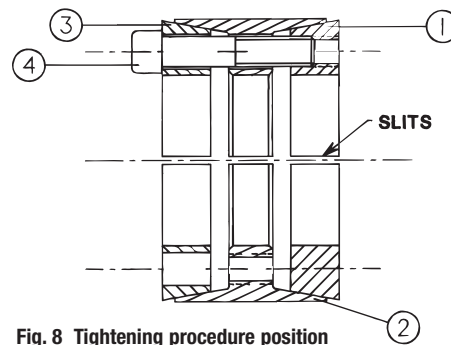


Fig. 8 Tightening procedure position

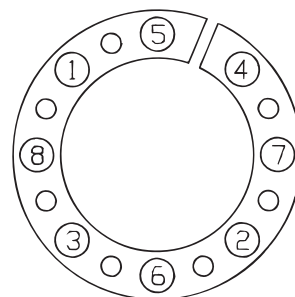


Fig. 9 Recommended screw tightening sequence

Tightening torques (T_A) in lb-ft for Locking Screws DIN 912-12.9

Screw Size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27
Hexkey Size (mm)	5	6	8	10	12	14	14	17	17	19	19
for RFN 7005 & 7009 (T_A)	13	30	61	107	170	262	358	509	686	—	—

Specifications: SERIES RFN 7005-INCH and METRIC

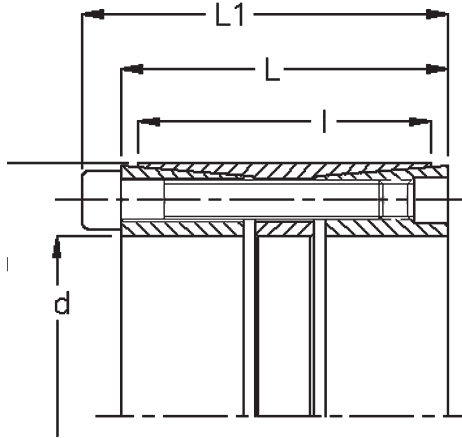


Fig. 10 SERIES RFN 7005-IN

NOTES:

$$F_{ax} = \text{axial load (thrust capacity)} = \frac{T \times 24 \text{ (lbs)}}{d}$$

The values of T, F_{ax} , p' are based on lightly oiled installation (coefficient of friction $\mu = 0.12$)

Surface Finish

Required surface finish for shaft O.D. and hub bore:

RMS 125 micro inches or better

HOW TO ORDER:

Specify SIZE and SERIES

e.g. 3-1/2 RFN 7005-IN

- d = nominal locking assembly I.D.
= shaft O.D.
- D = nominal locking assembly O.D.
= hub bore I.D.
- L₁, L = width dimensions, relaxed condition
- T = maximum transmissible torque
- p = contact pressure between locking assembly and shaft
- p' = contact pressure between locking assembly and hub bore
- T_A = required tightening torque per locking screw (tighten with torque wrench)
- D_N = min. hub O.D. for single unit installation based on hub material Y.P. as shown in table and hub width B=1.5 L₁ (c=0.8); for other hub materials calculate hub O.D. per step 3 of Selection Guide.
- TR = Allowable machining tolerance for shaft: use d + 0/-TR for hub bore: use D - 0/+TR

Example: for 3" RFN 7005-IN

required shaft size: 3.000" + .000/-0.002"

required hub bore size: 4.724" -

.000/+0.002"

d			D		TR		l		L		L1		screws				Torque		Shaft Pressure		Hub Pressure	
inch	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	Qty.	Size	Ft-lbs	Nm	Ft-lbs	Nm	psi	N/mm ²	psi	N/mm ²
1	1.000	25	1.969	50	0.0015	0.04	1.772	45	2.165	55	2.402	61	5	M6	12.5	17	479	649	22,610	156	11,510	79
		x	1.969	50	0.0015	0.04	1.772	45	2.165	55	2.402	61	5	M6	12.5	17	487		22,255		11,510	
		x	2.165	55	0.0015	0.04	1.260	32	1.575	40	1.811	46	6	M6	12.5	17	645	875	36,540	252	13,920	96
1 1/8	1.125	30	2.165	55	0.0015	0.04	1.772	45	2.165	55	2.402	61	6	M6	12.5	17	668		24,050		12,470	
1 3/16	1.188	x	2.165	55	0.0015	0.04	1.260	32	1.575	40	1.811	46	6	M6	12.5	17	701	950	34,075	235	13,920	96
1 1/4	1.250	x	2.165	55	0.0015	0.04	1.772	45	2.165	55	2.402	61	6	M6	12.5	17	705		22,790		12,470	
1 3/8	1.375	35	2.362	60	0.0015	0.04	1.772	45	2.165	55	2.402	61	7	M6	12.5	17	870		25,950		10,635	
		x	2.362	60	0.0015	0.04	1.732	44	2.126	54	2.362	60	7	M6	12.5	17	959	1,300	24,070	166	10,875	75
		x	2.362	60	0.0015	0.04	1.772	45	2.165	55	2.402	61	7	M6	12.5	17	957		23,590		10,635	
1 7/16	1.438	x	2.559	65	0.0015	0.04	1.772	45	2.165	55	2.402	61	8	M6	12.5	17	1,134		22,795		13,920	
1 1/2	1.500	38	2.559	65	0.0015	0.04	1.772	45	2.165	55	2.402	61	8	M6	12.5	17	1,183		22,560		13,920	
		x	2.559	65	0.0015	0.04	1.772	45	2.165	55	2.402	61	8	M6	12.5	17	1,180	1,600	23,780	164	13,920	96
		x	2.559	65	0.0015	0.04	1.772	45	2.126	54	2.362	60	8	M6	12.5	17	1,239	1,680	22,620	156	13,920	96
1 5/8	1.625	40	2.953	75	0.0015	0.04	1.732	44	2.126	54	2.441	62	7	M8	30.2	41	2,065	2,800	36,395	251	15,805	109
		x	2.953	75	0.0015	0.04	1.732	44	2.126	54	2.441	62	7	M8	30.2	41	2,025		37,035		15,805	
		x	2.953	75	0.0015	0.04	1.732	44	2.126	54	2.441	62	7	M8	30.2	41	2,250	3,050	34,075	235	15,805	109
1 3/4	1.750	42	2.953	75	0.0015	0.04	1.732	44	2.126	54	2.441	62	7	M8	30.2	41	2,185		34,400		15,805	
		x	3.150	80	0.0015	0.04	2.205	56	2.520	64	2.835	72	8	M8	30.2	41	2,729	3,700	28,130	194	13,340	92
		x	3.150	80	0.0015	0.04	1.732	44	2.126	54	2.441	62	7	M8	30.2	41	2,700		28,355		13,340	
1 7/8	1.875	50	3.150	80	0.0015	0.04	2.205	56	2.520	64	2.835	72	8	M8	30.2	41	2,913	3,950	26,970	186	13,340	92
		x	3.150	80	0.0020	0.05	2.205	56	2.520	64	2.835	72	8	M8	30.2	41	2,865		27,410		13,340	
		x	3.150	80	0.0020	0.05	2.205	56	2.520	64	2.835	72	8	M8	30.2	41	2,960		26,555		13,340	
2	2.000	55	3.346	85	0.0020	0.05	2.205	56	2.598	66	2.913	74	9	M8	30.2	41	3,614	4,900	27,695	191	14,065	97
		x	3.346	85	0.0020	0.05	2.205	56	2.520	64	2.835	72	9	M8	30.2	41	3,545		28,220		14,065	
		x	3.346	85	0.0020	0.05	2.205	56	2.520	64	2.835	72	9	M8	30.2	41	3,650		26,410		14,065	
2 1/8	2.125	60	3.543	90	0.0020	0.05	2.205	56	2.520	64	2.835	72	10	M8	30.2	41	4,145		29,530		14,790	
		x	3.543	90	0.0020	0.05	2.205	56	2.598	66	2.913	74	10	M8	30.2	41	4,352	5,900	28,130	194	14,790	102
		x	3.543	90	0.0020	0.05	2.205	56	2.520	64	2.835	72	10	M8	30.2	41	4,375		27,980		14,790	
2 3/16	2.188	65	3.740	95	0.0020	0.05	2.205	56	2.520	64	2.835	72	10	M8	30.2	41	4,530		27,250		13,920	
		x	3.740	95	0.0020	0.05	2.205	56	2.598	66	2.913	74	10	M8	30.2	41	4,757	6,450	25,955	179	13,920	96
		x	3.740	95	0.0020	0.05	2.205	56	2.520	64	2.835	72	10	M8	30.2	41	4,645		26,570		13,920	
2 1/4	2.250	70	4.331	110	0.0020	0.05	2.756	70	3.150	80	3.543	90	10	M10	61.2	83	8,076	10,950	30,740	212	15,660	108
		x	4.331	110	0.0020	0.05	2.756	70	3.071	78	3.465	88	10	M10	61.2	83	7,690		32,275		15,660	
		x	4.331	110	0.0020	0.05	2.756	70	3.071	78	3.465	88	10	M10	61.2	83	7,875		31,525		15,660	
2 3/4	2.750	75	4.528	115	0.0020	0.05	2.756	70	3.071	78	3.465	88	10	M10	61.2	83	8,400		29,340		14,935	
		x	4.528	115	0.0020	0.05	2.756	70	3.150	80	3.543	90	10	M10	61.2	83	8,629	11,700	28,565	197	14,935	103
		x	4.528	115	0.0020	0.05	2.756	70	3.071	78	3.465	88	10	M10	61.2	83	8,580		28,715		14,935	

Specifications: SERIES RFN 7005-INCH and METRIC

Chart continued from previous page

d			D		TR		I		L		L1		screws				Torque		Shaft Pressure		Hub Pressure	
inch	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	Qty.	Size	Ft-lbs	Nm	Ft-lbs	Nm	psi	N/mm ²	psi	N/mm ²
3	3.000		x	4.724	120	0.0020	0.05	2.756	70	3.071	78	3.465	88	11	M10	61.2	83	9,655		31,060		15,805
		80	x	4.724	120	0.0020	0.05	2.756	70	3.150	80	3.543	90	11	M10	61.2	83	10,141	13,750	29,580	204	15,805
3 1/8	3.125		x	4.724	120	0.0020	0.05	2.756	70	3.071	78	3.465	88	11	M10	61.2	83	10,060		29,820		15,805
3 1/4	3.250		x	4.724	120	0.0020	0.05	2.756	70	3.071	78	3.465	88	11	M10	61.2	83	10,460		28,670		15,805
		85	x	4.921	125	0.0020	0.05	2.756	70	3.150	80	3.543	90	12	M10	61.2	83	11,801	16,000	30,305	209	16,530
3 3/8	3.375		x	4.921	125	0.0020	0.05	2.756	70	3.071	78	3.465	88	12	M10	61.2	83	11,900		30,045		16,530
		90	x	5.118	130	0.0025	0.06	2.756	70	3.150	80	3.543	90	12	M10	61.2	83	12,465	16,900	28,565	197	15,805
3 7/16	3.438		x	5.118	130	0.0025	0.06	2.756	70	3.071	78	3.465	88	12	M10	61.2	83	12,090		29,445		15,805
3 1/2	3.500		x	5.118	130	0.0025	0.06	2.756	70	3.071	78	3.465	88	12	M10	61.2	83	12,310		28,915		15,805
3 5/8	3.625		x	5.315	135	0.0025	0.06	2.756	70	3.071	78	3.465	88	12	M10	61.2	83	12,735		27,975		15,225
		95	x	5.315	135	0.0025	0.06	2.756	70	3.150	80	3.543	90	12	M10	61.2	83	13,143	17,820	27,115	187	15,225
3 3/4	3.750		x	5.709	145	0.0025	0.06	3.543	90	3.937	100	4.409	112	11	M12	106.9	145	18,070		29,685		15,225
3 7/8	3.875		x	5.709	145	0.0025	0.06	3.543	90	3.937	100	4.409	112	11	M12	106.9	145	18,675		28,730		15,225
		100	x	5.709	145	0.0025	0.06	3.543	90	4.016	102	4.488	114	11	M12	106.9	145	18,974	25,725	28,275	195	15,225
3 15/16	3.937		x	5.709	145	0.0025	0.06	3.543	90	3.937	100	4.409	112	11	M12	106.9	145	18,974		28,275		15,225
4	4.000		x	5.709	145	0.0025	0.06	3.543	90	3.937	100	4.409	112	11	M12	106.9	145	19,275		27,830		15,225
		110	x	6.102	155	0.0025	0.06	3.543	90	4.016	102	4.488	114	12	M12	106.9	145	22,754	30,850	27,985	193	15,515
4 3/8	4.375		x	6.102	155	0.0025	0.06	3.543	90	3.937	100	4.409	112	12	M12	106.9	145	22,985		27,705		15,515
4 7/16	4.438		x	6.496	165	0.0025	0.06	3.543	90	3.937	100	4.409	112	14	M12	106.9	145	27,210		31,955		16,965
4 1/2	4.500		x	6.496	165	0.0025	0.06	3.543	90	3.937	100	4.409	112	14	M12	106.9	145	27,590		31,510		16,965
		120	x	6.496	165	0.0025	0.06	3.543	90	4.016	102	4.488	114	14	M12	106.9	145	28,968	39,275	30,015	207	16,965
4 3/4	4.750		x	6.496	165	0.0025	0.06	3.543	90	3.937	100	4.409	112	14	M12	106.9	145	29,125		29,850		16,965
4 15/16	4.938		x	7.087	180	0.0025	0.06	4.094	104	4.567	116	5.118	130	12	M14	170	230	35,790		28,260		15,950
		130	x	7.087	180	0.0025	0.06	4.094	104	4.567	116	5.118	130	12	M14	170	230	37,099	50,300	27,260	188	15,950
5	5.000		x	7.087	180	0.0025	0.06	4.094	104	4.567	116	5.118	130	12	M14	170	230	36,240		27,905		15,950
		140	x	7.480	190	0.0025	0.06	4.094	104	4.567	116	5.118	130	14	M14	170	230	46,614	63,200	29,580	204	17,545
5 7/16	5.438		x	7.480	190	0.0025	0.06	4.094	104	4.567	116	5.118	130	14	M14	170	230	45,985		29,985		17,545
5 1/2	5.500		x	7.480	190	0.0025	0.06	4.094	104	4.567	116	5.118	130	14	M14	170	230	46,510		29,645		17,545
		150	x	7.874	200	0.0025	0.06	4.094	104	4.567	116	5.118	130	15	M14	170	230	53,510	72,550	29,580	204	17,835
5 15/16	5.938		x	7.874	200	0.0025	0.06	4.094	104	4.567	116	5.118	130	15	M14	170	230	53,795		29,425		17,835
6	6.000		x	8.268	210	0.0025	0.06	4.094	104	4.567	116	5.118	130	16	M14	170	230	58,645		30,710		18,125
		160	x	8.268	210	0.0025	0.06	4.094	104	4.567	116	5.118	130	16	M14	266	360	60,886	82,550	29,580	204	18,125
6 7/16	6.438		x	8.858	225	0.0025	0.06	5.276	134	5.748	146	6.378	162	14	M16	266	360	73,635		26,080		15,515
		170	x	8.858	225	0.0025	0.06	5.276	134	5.866	149	6.496	165	14	M16	266	360	76,559	103,800	25,085	173	15,515
6 1/2	6.500		x	8.858	225	0.0025	0.06	5.276	134	5.748	146	6.378	162	14	M16	266	360	74,350		25,830		15,515
		180	x	9.252	235	0.0025	0.06	5.276	134	5.866	149	6.496	165	15	M16	266	360	86,885	117,800	25,375	175	15,950
6 15/16	6.938		x	9.252	235	0.0025	0.06	5.276	134	5.748	146	6.378	162	15	M16	266	360	85,050		25,925		15,950
7	7.000		x	9.252	235	0.0025	0.06	5.276	134	5.748	146	6.378	162	15	M16	266	360	85,815		25,690		15,950
7 7/16	7.438		x	9.843	250	0.0025	0.06	5.276	134	5.748	146	6.378	162	16	M16	266	360	97,240		25,815		15,950
		190	x	9.843	250	0.0030	0.08	5.276	134	5.866	149	6.496	165	16	M16	266	360	97,800	132,600	25,665	177	15,950
7 1/2	7.500		x	9.843	250	0.0030	0.08	5.276	134	5.748	146	6.378	162	16	M16	266	360	98,060		25,600		15,950
		200	x	10.236	260	0.0030	0.08	5.276	134	5.866	149	6.496	165	16	M16	266	360	103,258	140,000	24,360	168	15,370
7 15/16	7.938		x	10.236	260	0.0030	0.08	5.276	134	5.748	146	6.378	162	16	M16	266	360	104,140		24,155		15,370
8	8.000		x	10.433	265	0.0030	0.08	5.276	134	5.748	146	6.378	162	16	M16	266	360	104,960		23,965		15,080
			x	12.008	305	0.0030	0.08	5.276	134	5.748	146	6.378	162	20	M16	266	360	153,145		28,015		17,255
		220	x	11.220	285	0.0030	0.08	5.276	134	5.866	149	6.496	165	18	M16	266	360	127,598	173,000	24,940	172	15,805
		240	x	12.008	305	0.0030	0.08	5.276	134	5.748	146	6.378	162	20	M16	266	360	160,788	218,000	26,680	184	17,255
		260	x	12.795	325	0.0035	0.09	5.276	134	5.748	146	6.378	162	20	M16	266	360	175,539	238,000	24,650	170	16,095
		280	x	13.976	355	0.0035	0.09	6.496	165	6.969	177	7.756	197	18	M20	509	690	265,522	360,000	26,825	185	16,965
		300	x	14.764	375	0.0035	0.09	6.496	165	6.969	177	7.756	197	20	M20	509	690	315,676	428,000	27,840	192	17,835
		320	x	15.945	405	0.0035	0.09	6.496	165	6.969	177	7.756	197	21	M20	509	690	354,029	480,000	27,260	188	17,255
		340	x	16.732	425	0.0035	0.09	6.496	165	6.969	177	7.756	197	22	M20	509	690	393,857	534,000	26,970	186	17,255
		360	x	17.913	455	0.0035	0.09	7.480	190	7.953	202	8.819	224	21	M22	686	930	494,165	670,000	25,520	176	16,675
		380	x	18.701	475	0.0035	0.09	7.480	190	7.953	202	8.819	224	22	M22	686	930	547,270	742,000	25,375	175	16,675
		400	x	19.488	495	0.0035	0.09	7.480	190	7.953	202	8.819	224	24	M22	686	930	429,260	582,000	26,245	181	17,400
		420	x	20.276	515	0.0035	0.09	7.480	190	7.953	202	8.819	224	24	M22	686	930	659,379	894,000	25,085	173	16,820
		440	x	21.063	535	0.0035	0.09	7.480	190	7.953	202	8.819	224	24	M22	686	930	691,094	937,000	23,925	165	16,240
		460	x	21.850	555	0.0035	0.09	7.480	190	7.953	202	8.819	224	24	M22	686	930	722,809	980,000	22,910	158	15,515
		480	x	22.638	575	0.0035	0.09	7.480	190	7.953	202	8.819	224	28	M22	686	930	885,072	1,200,000	25,520	176	17,545
		500	x	23.425	595	0.004	0.10	7.480	190	7.953	202	8.819	224	28								

3 Specifications: SERIES RFN 7009 INCH AND METRIC

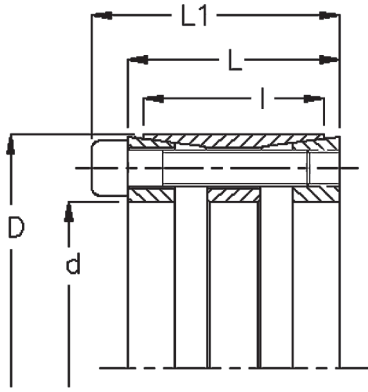


Fig. 11 SERIES RFN 7009

- d = nominal locking assembly I.D.
= shaft O.D.
- D = nominal locking assembly O.D.
= hub bore I.D.
- L₁, L, I = width dimensions, in relaxed condition
- T = maximum transmissible torque
- p = contact pressure between locking assembly and shaft
- p' = contact pressure between locking assembly and hub bore
- T_A = required tightening torque per locking screw (tighten with torque wrench)

HOW TO ORDER:
Specify SIZE and SERIES
e.g. 80 X 120 RFN 7009

D_N = min. hub O.D. for single unit installation based on hub material Y.P. as shown in table and hub width B=1.5 L₁ (c=0.8); for other hub materials calculate hub O.D. per step 3 of Selection Guide.

TR = Allowable machining tolerance for shaft: use d + 0/-TR
for hub bore: use D - 0/+TR

Example: for 80 RFN 7009
required shaft size: 3.150" + .000/-0.002"
required hub bore size: 4.724" - .000/+0.002"

NOTES:
F_{ax} = axial load (thrust capacity) = $\frac{T \times 24 \text{ (lbs)}}{d}$

The values of T, F_{ax}, p' are based on lightly oiled installation (coefficient of friction μ = 0.12)

Surface Finish

Required surface finish for shaft O.D. and hub bore:
RMS 125 micro inches or better

d			D		TR		I		L		L1		screws				Torque		Shaft Pressure		Hub Pressure		
inch	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	Qty.	Size	Ft-lbs	Nm	Ft-lbs	Nm	psi	N/mm ²	psi	N/mm ²	
2 3/4	2.750	70	x	4.331	110	0.0020	0.05	1.969	50	2.362	60	2.756	70	8	M10	61	83	5,274	7,150	28,130	194	15,515	107
2 15/16	2.938	70	x	4.331	110	0.0020	0.05	1.969	50	2.362	60	2.756	70	8	M10	61	83	5,260		28,195		15,515	
2 7/8	2.875	70	x	4.528	115	0.0020	0.05	1.969	50	2.362	60	2.756	70	8	M10	61	83	6,185		30,340		16,695	
3	3.000	70	x	4.528	115	0.0020	0.05	1.969	50	2.362	60	2.756	70	8	M10	61	83	6,320		29,690		16,695	
3 1/8	3.125	80	x	4.724	120	0.0020	0.05	1.969	50	2.362	60	2.756	70	10	M10	61	83	7,200		32,280		17,835	
3 1/4	3.250	80	x	4.724	120	0.0020	0.05	1.969	50	2.362	60	2.756	70	10	M10	61	83	7,560	10,250	30,740	212	17,835	123
3 7/16	3.438	80	x	4.724	120	0.0020	0.05	1.969	50	2.362	60	2.756	70	10	M10	61	83	7,500		30,985		17,835	
3 1/2	3.500	80	x	4.724	120	0.0020	0.05	1.969	50	2.362	60	2.756	70	10	M10	61	83	7,800		29,795		17,835	
3 15/16	3.937	90	x	5.118	130	0.0025	0.06	1.969	50	2.362	60	2.756	70	11	M10	61	83	9,293	12,600	30,015	207	18,125	125
4	4.000	90	x	5.118	130	0.0025	0.06	1.969	50	2.362	60	2.756	70	11	M10	61	83	9,015		30,940		18,125	
4 3/8	4.375	90	x	5.118	130	0.0025	0.06	1.969	50	2.362	60	2.756	70	11	M10	61	83	9,180		30,380		18,125	
4 7/16	4.438	100	x	5.709	145	0.0025	0.06	2.362	60	2.756	70	3.228	82	10	M12	107	145	13,719	18,600	29,725	205	18,270	126
4 1/2	4.500	100	x	5.709	145	0.0025	0.06	2.362	60	2.756	70	3.228	82	10	M12	107	145	13,719		29,725		18,270	
4 3/4	4.750	110	x	5.709	145	0.0025	0.06	2.362	60	2.756	70	3.228	82	10	M12	107	145	13,935		29,260		18,270	
4 15/16	4.938	110	x	6.102	155	0.0025	0.06	2.362	60	2.756	70	3.228	82	10	M12	107	145	15,120	20,500	27,115	187	17,110	118
5	5.000	110	x	6.102	155	0.0025	0.06	2.362	60	2.756	70	3.228	82	10	M12	107	145	15,270		26,845		17,110	
5 1/4	5.250	110	x	6.496	165	0.0025	0.06	2.362	60	2.756	70	3.228	82	11	M12	107	145	16,970		29,020		17,690	
5 7/16	5.438	120	x	6.496	165	0.0025	0.06	2.362	60	2.756	70	3.228	82	11	M12	107	145	17,210		28,620		17,690	
5 1/2	5.500	120	x	6.496	165	0.0025	0.06	2.362	60	2.756	70	3.228	82	11	M12	107	145	18,070	24,500	27,260	188	17,690	122
5 15/16	5.938	120	x	6.496	165	0.0025	0.06	2.362	60	2.756	70	3.228	82	11	M12	107	145	18,165		27,110		17,690	
6	6.000	120	x	6.496	165	0.0025	0.06	2.362	60	2.756	70	3.228	82	11	M12	107	145	24,050		29,610		18,560	
6 1/16	6.438	130	x	7.087	180	0.0025	0.06	2.559	65	3.110	79	3.583	91	14	M12	107	145	24,930	33,800	28,565	197	18,560	128
6 1/8	6.438	130	x	7.087	180	0.0025	0.06	2.559	65	3.110	79	3.583	91	14	M12	107	145	24,355		29,240		18,560	
6 1/4	6.500	130	x	7.480	190	0.0025	0.06	2.559	65	3.110	79	3.583	91	14	M12	107	145	28,800		29,830		18,850	
6 3/8	6.438	140	x	7.480	190	0.0025	0.06	2.559	65	3.110	79	3.583	91	15	M12	107	145	30,240	41,000	28,420	196	18,850	130
6 1/2	6.500	140	x	7.480	190	0.0025	0.06	2.559	65	3.110	79	3.583	91	15	M12	107	145	29,830		28,810		18,850	
6 3/4	6.438	150	x	7.480	190	0.0025	0.06	2.559	65	3.110	79	3.583	91	15	M12	107	145	30,170		28,480		18,850	
6 7/8	6.438	150	x	7.874	200	0.0025	0.06	2.559	65	3.110	79	3.583	91	15	M12	107	145	30,380	41,800	26,535	183	17,835	123
6 15/16	6.938	150	x	7.874	200	0.0025	0.06	2.559	65	3.110	79	3.583	91	15	M12	107	145	30,990		26,395		17,835	
7	7.000	160	x	8.268	210	0.0025	0.06	2.559	65	3.110	79	3.583	91	16	M12	107	145	33,370		27,860		18,125	
7 1/16	7.438	160	x	8.858	225	0.0025	0.06	3.071	78	3.622	92	4.173	106	15	M14	170	230	46,115		29,095		19,285	
7 1/8	7.438	170	x	8.268	210	0.0025	0.06	2.559	65	3.110	79	3.583	91	16	M12	107	145	35,034	47,500	26,535	183	18,125	125
7 1/4	7.438	170	x	8.858	225	0.0025	0.06	3.071	78	3.622	92	4.173	106	15	M14	170	230	47,941	65,000	27,985	193	19,285	133
7 3/8	7.438	180	x	8.858	225	0.0025	0.06	3.071	78	3.622	92	4.173	106	15	M14	170	230	46,560		28,815		19,285	
7 1/2	7.500	180	x	9.252	235	0.0025	0.06	3.071	78	3.622	92	4.173	106	15	M14	170	230	50,892	69,000	26,390	182	18,415	127
7 5/8	7.438	180	x	9.252	235	0.0025	0.06	3.071	78	3.622	92	4.173	106	15	M14	170	230	49,815		27,510		18,415	
7 3/4	7.438	190	x	9.252	235	0.0025	0.06	3.071	78	3.622	92	4.173	106	15	M14	170	230	50,265		27,265		18,415	
7 7/8	7.438	190	x	9.843	250	0.0025	0.06	3.465	88	4.016	102	4.567	116	16	M14	170	230	55,400		24,385		14,935	
8	8.000	190	x	9.843	250	0.0025	0.06	3.465	88	4.016	102	4.567	116	16	M14	170	230	56,835		23,770		14,935	
8 1/16	8.438	200	x	9.843	250	0.0030	0.08	3.465	88	4.016	102	4.567	116	16	M14	170	230	57,161	77,500	23,635	163	14,935	103
8 1/8	8.438	200	x	9.843	250	0.0030	0.08	3.465	88	4.016	102	4.567	116	16	M14	170	230	57,310		23,575		14,935	
8 1/4	8.500	200	x	10.236	260	0.0030	0.08	3.465	88	4.016	102	4.567	116	18	M14	170	230	75,231	102,000	28,130	194	17,980	124
8 3/8	8.438	220	x	10.236	260	0.0030	0.08	3.465	88	4.016	102	4.567	116	18	M14	170	230	75,875		27,890		17,980	
8 1/2	8.500	220	x	11.220	285	0.0030	0.08	3.780	96	4.252	108	4.882	124	15	M16	262	355	86,295	117,000	25,230	174	16,385	113
8 3/4	8.438	240	x	12.008	305	0.0030	0.08	3.780	96	4.252	108	4.882	124	20	M16	262	355	125,385	170,000	30,740	212	20,300	140
8 7/8	8.438	260	x	12.795	325	0.0035	0.09	3.780	96	4.252	108	4.882	124	20	M16	262	355	142,349	193,000	29,725	205	20,010	138
9	9.000	280	x	13.976	355	0.0035	0.09	3.780	96	4.331	110	5.118	130	15	M20	509	690	171,114	232,000	30,885	213	20,445	141
9 1/16	9.438	300	x	14.764	375	0.0035	0.09	3.780	96	4.331	110	5.118	130	15	M20	509	690	183,652	249,000	28,710	198	19,430	134
9 1/8	9.438	320	x	15.945	405	0.0035	0.09	4.882	124	5.354	136	6.142	156	20	M20	509	690	261,096	354,000	27,695	191	18,125	125
9 1/4	9.438	340	x	16.732	425	0.0035	0.09	4.882	124	5.354	136	6.142	156	20	M20	509	690	277,323	376,000	26,100	180	17,255	119
9 3/8	9.438	360	x	17.913	455	0.0035	0.09	5.512	140	6.102	155	6.969	177	20	M22	686	930	365,830	496,000	26,825	185	17,110	118
9 1/2	9.438	380	x	18.701	475	0.0035	0.09	5.512	140	6.102	155	6.969	177	20	M22	686	930	386,481	524,000	25,375	175	16,385	113
9 3/4	9.438	400	x	19.488	495	0.0035	0.09	5.512	140	6.102	155	6.969	177	22	M22	686	930						

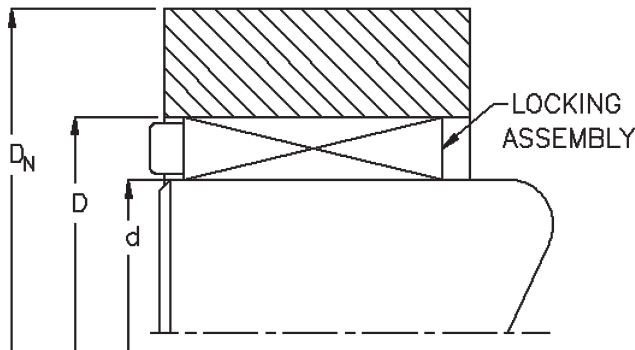


Fig. 12

Hub Calculation

(see pages 4 and 8-10 for additional dimensional data.)

$$D_N = \frac{D \times YP + (C3 \times p')}{YP - (C3 \times p')}$$

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

p' = contact pressure between Locking Assembly and hub, see specification tables.

B = Hub width

D_N = required hub O.D.

C3 = stress reduction factors, depending on hub width (B)

C3 = 0.6 if hub width B = 2L1

C3 = 0.8 if B = 1.5 L1 or with two or more units and B = L3 (1 + n); n = number of units

C3 = 1.0 for B = L1

Inch					Metric				
ID In	D _N (in Inches)				ID mm	D _N (in Inches)			
	7003	7006	7005	7009		7003	7006	7005	7009
0.7500	2.78	2.52			19	2.78	2.52		
0.8750	2.81	2.52			20	2.78	2.52		
1.0000	3.18	2.82	2.56		22	2.81	2.52		
1.1250	3.36	3.00	2.88		24	2.96	2.82		
1.1875	3.36	3.00	2.88		25	3.18	2.82	2.71	
1.2500	4.00	3.45	3.01		28	3.36	3.00	2.98	
1.3750	4.00	3.45	3.01		30	3.36	3.00	2.98	
1.4375	4.26	3.71	3.52		32	4.00	3.45		
1.5000	4.26	3.71	3.52		35	4.00	3.45	3.02	
1.6250	5.41	4.65	4.26		38	4.26	3.71	3.69	
1.7500	5.41	4.65	4.26		40	4.26	3.71	3.69	
1.8750	5.52	4.87	4.28		42	5.41	4.65	4.26	
1.9375	5.52	4.87	4.28		45	5.41	4.65	4.26	
2.0000	5.52	4.87	4.28		48			4.28	
2.1250	6.28	5.27	4.62		50	5.52	4.87	4.28	
2.1875	6.28	5.27	4.62		55	6.28	5.27	4.62	
2.2500	6.35	5.37	4.98		60	6.35	5.37	4.98	
2.3750	6.35	5.37	4.98		65	7.02	5.89	5.15	
2.4375	7.02	5.89	5.15		70	8.32	6.96	6.23	5.34
2.5000	7.02	5.89	5.15		75	8.30	6.99	6.39	
2.5625	7.02	5.89	5.15		80	8.66	7.16	6.82	6.00
2.6875	8.51	6.96	6.23		85	9.46	7.75	7.24	
2.7500	8.32	6.96	6.23	6.20	90	9.38	7.91	7.39	6.53
2.8750	8.30	6.99	6.39	6.68	95	10.21	8.54	7.56	
2.9375	8.30	6.99	6.39	6.68	100	11.53	9.48	8.12	6.94
3.0000	8.66	7.16	6.82	7.18	110	11.72	9.73	8.74	7.32
3.1250			6.82	7.18	120	12.48	10.65	9.66	7.85
3.2500	9.46	7.75	7.10	7.48	130	12.99	11.39	10.27	8.65
3.3750	9.46	7.75	7.23		140	12.57	11.55	11.29	9.16
3.4375	9.38	7.91	7.39	7.84	150	14.44	12.65	11.98	9.55
3.5000	9.38	7.91	7.39	7.84	160	15.16	13.18	12.67	10.06
3.6250			7.56		170	13.84	12.60	12.69	10.88
3.7500	10.21	8.54	7.56		180	14.46	13.16	13.40	11.25
3.8750			8.12		190			14.26	11.58
3.9375	11.53	9.48	8.12	8.78	200			14.61	12.41
4.0000	11.53	9.48	8.12	8.78	220			16.19	13.38
4.3750			8.74	9.11	240			17.99	14.95
4.4375	11.72	9.73	9.07	9.25	260			19.02	15.88
4.5000			9.66	9.84	280			20.78	17.89
4.7500	12.48	10.65	9.66	9.84	300			22.46	18.70
4.9375	12.99	11.39	10.27	10.99	320			23.89	19.86
5.0000	12.99	11.39	10.27	10.99	340			25.07	20.63
5.4375	12.57	11.55	11.29	11.69	360			26.44	21.94
5.5000			11.29	11.69	380			27.60	22.75
5.9375	14.44	12.65	11.98	11.98	400			29.31	24.11
6.0000			12.67	12.67	420			30.04	25.34
6.4375	13.84	12.60	12.69	14.01	440			30.74	26.77
6.5000			12.69	14.01	460			31.31	27.49
6.9375	14.46	13.16	13.40	14.29	480			34.17	28.48
7.0000			13.40	14.29	500			34.83	29.27
7.4380			14.26	13.90	520			36.55	30.77
7.5000			14.26	13.90	540			37.17	31.56
7.9380			14.61	15.63	560			38.93	32.89
8.0000			14.78		580			40.12	33.66
9.0000			17.99		600			40.84	34.42

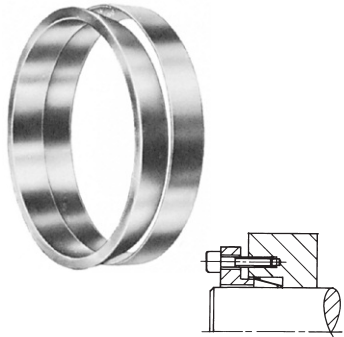
Note: Calculations made with a Stress Reduction Factor C3=0.8 and Hub Material Yield Point=36,000psi

We also Supply . . .

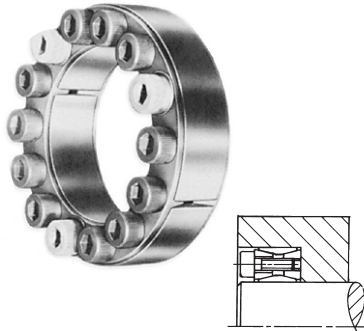
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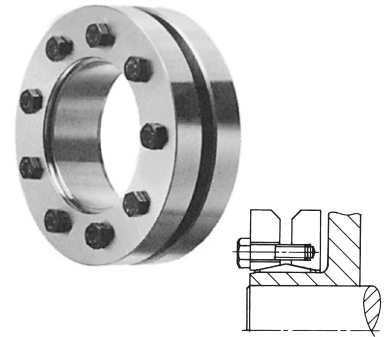
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