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BALL AND ROLLER BEARINGS INSTALLATION INSTRUCTIONS

These instructions cover setscrew and eccentric locking ball and roller bearings. It is important that they be read in their entirety before attempting installation or removal. The procedures indicated should be carefully followed. Failure to do so can result in mis-installation, which could cause bearing performance problems as well as serious personal injury.

BALL BEARING INSERT INSTALLATION

SPHERICAL OD INSERTS - Place into housing load slot, positioning the anti-rotation rivet in the load slot. Using a bar slipped into the insert bore, swing insert into place within the housing. A snug fit should result. If insert can swivel by hand, the housing fit is too loose, replace entire unit. If heavy force is required, fit is too tight ***(Do not hammer)***. - replace entire unit. Insure alignment of the lube hole in outer race and the grease groove in housing bore.

CYLINDRICAL OD INSERTS - Be sure housing bore is clean and free of debris. Press the bearing into the housing by applying force to the face of the outer ring. ***Do not hammer on any component of the bearing or apply force to inner ring.*** For recommended housing bore tolerance, consult BROWNING/EPT Bearing Application Engineering.

BEARING INSTALLATION

1. **CHECK AREA -** Clean and organize bearing installation area, and keep well lit. Be sure mounting surfaces are clean and flat.
2. **CHECK SHAFT -** Shaft should be within tolerance range shown in Table 1, clean, and free of nicks and burrs. Mount bearing on unused section of shafting or repair/replace shafting as required.
3. **INSTALL UNIT -** Slide the bearing unit and/or locking collar on shaft. (If the projecting side of the bearing is to be mounted toward the machine, put the locking collar on first.) If it is difficult to mount the bearing on shaft, use a piece of emery cloth to reduce any high spots on shaft. ***Do not hammer on any component of the bearing***
4. **CENTER INSERT -** The expansion unit must be centered in the housing to allow axial shaft expansion. Move the bearing as far as it will go in both directions in the housing and determine the centered position. It may be necessary to unload the bearing while moving the assembly.
5. **FASTEN UNIT IN PLACE -** Install housing attachment bolts, check and align bearing and tighten attachment bolts. Rotate shaft slowly to center bearing.
   - 5.1 **SET SCREW INSERTS**
     - a. Setscrews in a multiple bearing setup should be aligned.
     - b. Torque first set screw to one half recommended torque. Torque second set screw to full torque. Torque first set screw to full torque. Review Table 2 for Ball Bearings and Tables 3 and 4 for Roller Bearings set screw torque.
     - c. Check shaft again for freedom of rotation.
   - 5.2 **ECCENTRIC LOCK INSERTS**
     - a. Rotate locking collar in the direction of shaft rotation until hand tight. Lock tightly with a drift pin and hammer or spanner wrench and hammer. Tighten setscrews to torque specified in Table 5.
     - b. Check shaft again for freedom of rotation.
   - 5.3 **BOA CONCENTRIC INSERTS**
     - a. Be sure that BOA concentric collar is fitted square and snug against the shoulder on the inner ring.
     - b. Torque BOA concentric collar cap screw to torque recommended in Table 6.
6. **CHECK HOUSING ALIGNMENT -** The maximum permissible static misalignment of the shaft is 2° for ball bearings, 1.5° for roller bearings, except for 900 and 920 series tapered roller bearings. The 900 and 920 series have no misalignment capabilities.
7. **INSTALL 2nd UNIT -** Repeat Steps 4 through 6 for each additional bearing used on the shaft

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RELUBRICATION INSTRUCTIONS

BROWNING® Brand Bearing Units are factory lubricated with high quality lithium soap grease with an EP additive. The bearing is ready for use with no initial lubrication required. However, for slow speed applications less than 100 RPM, operating in dirty or wet environment, sufficient additional grease should be applied at start-up to completely fill the void in the bearing. Lubrication intervals depend upon the type of application, speed and other external conditions. For general use, suggested intervals are shown in Table 6 for roller bearings and Table 9 for ball bearings. Grease charge amounts are shown in Table 7 for roller bearings and Table 8 for ball bearings. Experience will determine the best interval for each specific application. For safety, stop rotating equipment. Add one half the recommended amount shown in Table 7 or 8. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. Lubricate with lithium soap grease with EP additive, which conforms to NLGI 2 consistency and is suitable for an operating range of –20°F to +250°F.

Compatibility of grease is critical, therefore consult with BROWNING/EPT Engineering Department and your grease supplier for current grease specifications to ensure any greases used are compatible. For applications operating below –20°F, above 250°F, and all other applications, contact BROWNING/EPT Engineering Department at 219-465-2211*.

Table 1

RECOMMENDED SHAFT TOLERANCES	
Nominal Shaft Size (inches)	**Shaft Tolerance (inches)**
1 1/8 to 1 15/16	+.0000/-.0005
2 to 3 15/16	+.0000/-.0010
4 to 4 15/16	+.0000/-.0015

Table 2

SET SCREW TIGHTENING (BALL BEARINGS)					
Set Screw Locking		**Eccentric Lock**			
Bore Size (in) 100 & 200	**Bore Size (in) 300**	**Bore Size (in)**	**Screw Size**	**Hex Size**	**Torque (in-lbs.)**
1 1/2 - 5/8	-	-	10-32	3/32	28 - 36
3/4 - 1 1/4R	15/16 - 1	1/2 - 1	1/4-28	1/8	66 - 85
1 1/4 - 1 3/4	1 3/16 - 1	1 1/8 - 1 1/4R	5/16-24	5/32	126 - 164
1 15/16 - 2	1/2	1 1/4 - 1 15/16	3/8-24	3/16	228 - 296
2 1/2 - 3	1 11/16 - 2	2 - 2 7/16	7/16-20	7/32	348 - 452
15/16	3/16	2 11/16 - 2	1/2-20	1/4	504 - 655
-	2 7/16 - 3	15/16	-	-	-
-	15/16	-	-	-	-

Table 3

SET SCREW LOCK (TAPERED ROLLER)				
BORE SIZE	**SCREW SIZE**	**RECOMMENDED TORQUE**		
		(in-lbs.)	**(ft-lbs.)**	**(N-m)**
1 3/16 to 1 11/16	15/16 - 24	108-144	9 - 12	12 - 16
1 3/4 to 2 1/2	3/8 - 24	180-228	15 - 19	20 - 26
2 11/16 to 3 1/2	1/2 - 20	408-540	34 - 45	46 - 61
3 15/16 to 4	5/8 - 18	876-1140	73 - 95	99 - 129
4 7/16 to 5	3/4 - 16	1440-1800	120 - 150	163 - 203

Table 4

SETSCREW LOCK (SPHERICAL ROLLER)				
Bore Size	**Screw Size**	**Torque**		
		(in-lbs.)	**(ft-lbs.)**	**(N-m)**
1 1/8 to 2 3/16	3/8	250	20	290
2 7/16 to 3 1/2	1/2	535	45	655
3 7/16 to 4 15/16	5/8	1060	90	1310

Table 5

ECCENTRIC LOCK				
Bore Size	**Screw Size**	**Torque**		
		(in-lbs.)	**(ft-lbs.)**	**(N-m)**
1 1/8 to 2 3/16	3/16	250	20	290
2 7/16 to 3 1/2	7/32	360	30	435
3 7/16 to 4 15/16	1/4	535	45	655

Table 6

BOA CONCENTRIC TIGHTENING			
English Screw Size	**Hex Size**	**Torque**	
		(in-lbs.)	**(N-m)**
#8-32	T-25	65 - 70	7 - 8
#10-24	T-27	80 - 90	9 - 10
1/4-20	T-30	160 - 180	18 - 20
5/16-18	T-45	360 - 400	40 - 45

Table 7

RELUBRICATION INTERVALS FOR BROWNING® BRAND ROLLER BEARINGS			
A QUALITY LITHIUM SOAP GREASE WITH AN EP ADDITIVE SHOULD BE USED			
Speed RPM	**Temperature**	**Cleanliness**	**Greasing Interval**
100	-20° F to 125° F	Clean	1-4 Months
500	-20° F to 150° F	Clean	1 Week to 1 Month
1000	-20° F to 210° F	Clean	1-2 Weeks
1500 to Maximum Catalog Rating	Up to 150° F	Dirty	Daily to 1 week
	Over 150° F	Dirty	Daily to 1 week
	Up to 250° F	Very Dirty*	Daily to 1 week
	Up to 250° F	Extreme Conditions*	Daily to 1 week

Table 8

GREASE CHARGE FOR ROLLER BEARING RELUBRICATION	
SHAFT SIZE (inches)	**GREASE CHARGE (ounces)**
1 1/8 to 1 1/4	0.10
1 3/8 to 1 7/16	0.22
1 1/2 to 1 11/16	0.32
1 3/4 to 2	0.50
2 to 2 3/16	0.55
2 1/4 to 2 1/2	0.65
2 11/16 to 3	0.85
3 3/16 to 3 1/2	1.25
3 15/16 to 4	2.50
4 7/16 to 4 1/2	3.10
4 15/16 to 5	4.75

Table 9

GREASE CHARGE FOR BALL BEARING RELUBRICATION	
SHAFT SIZE (inches)	**GREASE CHARGE (ounces)**
1/2 to 3/4	0.03
7/8 to 1 3/16	0.10
1 1/4 to 1 1/2	0.15
1 11/16 to 1 15/16	0.30
2 to 2 15/16	0.50
34 to 3 7/16	0.85
3 1/2 to 4	1.50

Table 10

RELUBRICATION INTERVALS FOR BROWNING® BRAND BALL BEARINGS			
Speed RPM	**Temperature**	**Cleanliness**	**Relub. Intervals**
100	-20° F to 125° F	Clean	4-10 Months
500	-20° F to 150° F	Clean	1 to 4 Months
1000	-20° F to 200° F	Clean	1 Week to 1 Month
1500	-20° F to 200° F	Clean	Biweekly
1500 to Maximum Catalog Rating	Up to 150° F	Dirty	Daily to 1 week
	150° F to 200° F	Dirty	Daily to 1 week
	-20° F to 200° F	Very Dirty*	Daily to 1 week
	-20° F to 200° F	Extreme Conditions*	Daily to 1 week

APPLICATION ASSISTANCE:

Please contact Application Engineering at:

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⚠WARNING **Disconnect all power before adjusting units**

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