Link-Belt®

Link-Belt® Mounted & Unmounted Ball Bearings Installation Instructions, Sizes U200, S200, Y200, W200, CL200, U300, Y300, & U3K00

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FORM
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⚠ WARNING Indicates a hazard which, if not avoided, could result in serious injury or death.

NOTICE Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

GENERAL SAFETY INSTRUCTIONS

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock out power before installation and maintenance. Working on or near energized equipment can result in severe injury.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.
- Read and understand the information in this section and in this manual completely before attempting to install or remove Link-Belt Ball bearings. Failure to do so can result in improper installation which could cause bearing performance problems as well as serious personal injury.

HOUSED BEARING MOUNTING PROCEDURE

ALL UNITS
(For DURA-KLEAN Units see notes on page 3)

1. Inspect shaft size (see Shaft Tolerance **Table 2**). Shaft must be to correct size. Clean shaft and mounting surface as needed.
2. Position bearings on the shaft, applying all driving pressure to the face of the inner ring.

   NOTICE: Do not strike or exert pressure on housing or seals.
3. Where shimming is required — use full shims across the housing base — not just at the bolt holes. Position and loosely bolt housing to mounting base.
4. Establish the final shaft position. Align bearings by hand or rubber mallet if required. Bolt units down, if using U3K00 adapter mount, refer to instructions on the right.
5. Lock bearing to the shaft:

   Set Screw Lock Units (U200, S200, U300)
   Tighten the set screws on the bearing to the proper tightening torque which can be found in Set Screw Torque **Table 1**. Alternate torquing the screws to prevent unequal loading. See comment 8 in **Additional Installation Comments**.

   Eccentric Cam Lock Units (Y200, W200, Y300)
   Slide collar over the shaft until it rests over the cam of the inner ring. **Rotate the collar in the direction of normal shaft rotation until snug.** Utilizing a hammer and punch, rotate the collar until tight. Tighten set screws securely. Utilize torque values from Set Screw Torque **Table 1**. See comment 8 in **Additional Installation Comments**.

   Centrik-Lok Units (CL200)
   With the collar located between the tabs and housing with the chamfer facing the housing, alternately tighten the set screws (See **Figure 1**). to the recommended torque value from the Centrik-Lok® Set Screw Torque **Table 5** or **Table 6.**

TABLE 1 — Set Screw Torque

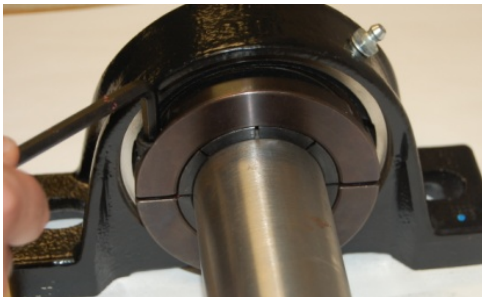
Set Screw Size	U200 Set Screw	Y200/W200 Cam Lock	S200 Set Screw	U300 Series Collar Mounted	Tightening Torque (in-lbs / N-m)
#10	2B08 – 211	…	212 – 216	312	33 – 40 / 3.7 – 4.5
1/4	212 – 2E20	2B08 – 216	217 – 223	314 – 316	87 – 92 / 9.8 – 10.4
5/16	220 – 228	217 – 2E20	224 – 231	318 – 324	165 – 185 / 18.6 – 20.9
3/8	230 – 239	220 – 2E32	…	326 – 331	290 – 325 / 32.8 – 36.7
7/16	240 – 243	232 – 239	…	332 – 339	430 – 460 / 48.6 – 52.0
1/2	244 – 2E56	…	…	343 – 347	620 – 680 / 70.0 – 76.8
5/8	263 – 2E64	…	…	348 – 356	1225 – 1350 / 138.4 – 152.5
3/4	…	…	…	363	2125 – 2350 / 240.1 – 265.5

TABLE 2 — Shaft Tolerance (Inches)

Set Screw Mount	Cam Lock Mount	CL200 Collar Mount	U3K00 Series Adapter	Tolerance Nominal to:
2B08-232 312-332	2B08-232	…	…	-0.0005"
234-2E64 334-363	234-239	…	…	-0.001"
…	…	212-232	…	-0.003"
…	…	234-264	327-355	-0.004"

Recommended shaft tolerances are generally satisfactory for loads up to 15% of C (see load ratings in catalog). High load applications will require a press fit to the shaft.

Figure 1 — Set screw tightening on a Centrik-Lok bearing



Adapter Mount Units (U3K00 Series)

a) **Zero Shaft Fit** — Take two large flat blade screw drivers to wedge between the bearing's face and lockwasher. Use the screwdriver to draw the bearing's sleeve through the inner ring until you achieve a snug fit and then finger tighten the locknut (See **Figure 2**). This should remove all the clearance between the shaft, adapter, and inner ring. When the lock nut is further tightened, the bearing will be displaced about 1/16" along the shaft.

b) **Final Tightening** — Mark the position of the locknut relative to the shaft with a grease pencil or a dark marker at the top of the locknut and shaft. Using a soft steel drift pin and hammer, drive against the face of the locknut to relieve thread pressure. Tighten the lock nut using the hammer and soft drift. The adapter should grab and stay positioned on the shaft. Force the lock nut ½ of one turn.

c) **Secure Locknut** — Bend one of the lock washer tangs into one of the slots on the outside diameter of the locknut. If necessary, slightly tighten the locknut to line up the closest tang.

d) **Installing Two Fixed Adapter Units**— When using 2 fixed bearings, care must be used to ensure one bearing is not loaded axially against the other. If installing 2 fixed pillow blocks, tighten the mounting bolts of the first unit, then follow steps a-c. Install the 2nd bearing as normal, & then tighten mounting bolts last.

EXPANSION UNITS ONLY

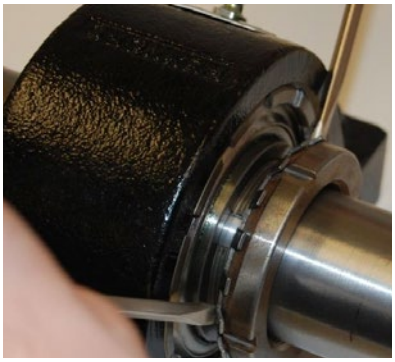
1. Center cartridge in outer housing. If maximum expansion capability is required, place cartridge in extreme position of housing to permit full movement of the cartridge in direction of expansion.
2. The remainder of the installation is the same as Fixed units.

ADDITIONAL INSTALLATION COMMENTS

1. Position housings for accessibility of grease fittings.
2. Spot drill or mill flats on shaft for increased holding power of set screws or ease of removal.
3. When an eccentric load condition exists, position set screws directly opposite from eccentric weight.
4. Shaft shoulders are recommended to support vertical shafts and high thrust loads. The shoulder diameter should not exceed the outside diameter of the inner ring.
5. When pillow blocks are mounted on an inclined plane or the work force is parallel with the base, either lateral bolts or welded stop blocks should be used to prevent shifting.
6. Avoid direct hammer blows to the bearing and its components by using a soft drift or block.
7. Coat the shaft & bearing bore with grease or oil to facilitate assembly.

   NOTICE: Do not coat U3K00 series bore or shaft.
8. If an Allen wrench is used as a torque wrench, place a length of pipe over the long end and pull until the wrench begins to twist.

Figure 2 — Zero Shaft Fit: Pry against housing to draw adapter sleeve through bearing. Sleeve should not be protruding out the backside of the inner ring.



LUBRICATION INFORMATION

Standard bearings come pre-lubricated from the factory with Mobil™* Ronex™* MP Grease. Mobil Ronex MP is an NLGI Grade 2 EP (extreme pressure) grease with a lithium complex thickener. It can be used for high loads, and in some cases at temperatures as low as -40°F or as high as +225°F. For high speeds, other special service conditions, or for inquires on other acceptable greases, please consult your local Rexnord® representative or the Rexnord Bearing Engineering Department. Oil lubrication is not recommended.

RELUBRICATION

Bearings should be re-lubricated at regular intervals. The frequency and amount of lubricant will be determined by the type of service. General guidelines for re-lubrication frequency and amount are based upon average application conditions. See Lubrication **Tables 3 and 4**. Oil lubrication is not recommended.

At High temperatures, greases tend to degrade more rapidly and thus require fresh grease more frequently. In general, small amounts of grease added frequently provide better lubrication. When equipment will not be in operation for some time, grease should be added to provide corrosion protection. This is particularly important for equipment exposed to severe weather.

AUTOMATIC LUBRICATION SYSTEMS

A variety of automatic re-lubrication systems are available for use with ball bearings. Key considerations are:

1. NLGI grade of grease used, consistent with system layout
2. An amount/frequency combination necessary to replenish the grease

MIXING OF GREASES

Mixing of any 2 greases should be checked with the lubricant manufacturer.

NOTICE: If the grease bases are different they should never be mixed.

* Mobil and Ronex are believed to be trademarks and/or trade names of Exxon Mobil Corporation and are not owned or controlled by Regal Rexnord™ Corporation or any of its affiliates.

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TABLE 3 — Lubrication, 200 Series Ball Bearings

SHAFT SIZE INCHES	To Lubricate Units (oz.)	RECOMMENDED NUMBER OF MONTHS BEWEEN RELUBRICATION (BASED ON 24/7 OPERATION)			
		Relube Interval			
		6 Months	4 Months	2 Months	1 Month
3/4 – 1	0.06	3200	4800	7200	9600
1 1/16 – 1 7/16	0.15	2200	3400	5100	6800
1 1/2 – 1 3/4	0.23	1700	2600	4000	5300
1 7/8 – 2 3/16	0.26	1400	2100	3200	4300
2 1/4 – 2 7/16	0.28	1300	2000	3000	4000
2 1/2 – 2 11/16	0.68	1000	1600	2400	3200
2 3/4 – 3	0.70	850	1650	2500	3300
3 1/16 – 3 1/2	1.12	900	1400	2100	2800
3 9/16 – 4	2.50	800	1200	1800	2300
		Shaft Speed in RPM			

Reduce lubrication intervals by half for vertical applications.

TABLE 4 — Lubrication, 300 Series Ball Bearings

SHAFT SIZE - INCHES		To Lubricate Units (oz.)	RECOMMENDED NUMBER OF MONTHS BEWEEN RELUBRICATION (BASED ON 24/7 OPERATION)			
			Relube Interval			
U300 & Y300 Series	U3K00 Adapter Series		6 Months	4 Months	2 Months	1 Month
3/4	···	0.08	4785	7520	10940	14360
7/8 – 1	···	0.11	4085	6420	9340	12260
1 1/8 – 1 3/16	···	0.15	3620	5610	8145	10860
1 1/4 – 1 7/16	···	0.22	3285	5095	7395	9860
1 1/2	···	0.30	3080	4930	7190	9450
1 5/8 – 1 3/4	···	0.41	2640	4225	6060	8100
1 15/16	1 11/16	0.52	2310	3850	5580	7315
2 – 2 3/16	1 15/16	0.70	2045	3410	4945	6480
2 1/4 – 2 7/16	…	0.83	1830	2990	4320	5815
2 11/16 – 2 3/4	2 3/16	1.25	1660	2580	3865	5155
2 15/16	2 7/16	1.50	1550	2410	3620	4825
3 – 3 3/16	2 11/16	1.80	1370	2225	3420	4450
3 7/16 – 3 1/2	2 15/16	2.42	1350	2025	3040	4050
3 15/16	3 7/16	3.27	1200	1885	2740	3600
			Shaft Speed in RPM			

Reduce lubrication intervals by half for vertical applications.

TABLE 5 — Standard Duty Centrik-Lok Set Screw Torque

Set Screw Size	CL200 Series	Tightening Torque (in-lbs / N-m)
#10	212 – 2E20	65 – 72 / 7.3 – 8.1
1/4	220 – 228	151 – 168 / 17.1 – 19.0
5/16	230 – 239	313 – 348 / 35.4 – 39.3
3/8	240 – 2E64	540 – 600 / 61.0 – 67.8

TABLE 6 — Medium Duty Centrik-Lok Set Screw Torque

Set Screw Size	M_CL200 Series	Tightening Torque (in-lbs / N-m)
#10	216	65 – 72 / 7.3 – 8.1
1/4	219 – 224	151 – 168 / 17.1 – 19.0
5/16	227 – 235	313 – 348 / 35.4 – 39.3
3/8	239 – 256	540 – 600 / 61.0 – 67.8

INSTALLATION INSTRUCTIONS

U200, S200, Y200, W200, CL200, U300, Y300, & U3K00

DISASSEMBLY of BEARING INSERT

1. Remove shaft locking device (collar or adapter assembly) and slide off shaft.
2. Place in vice.
3. With a shaft or bar, misalign bearing 90° in housing and remove through slots.
4. Clean and inspect housing. Do not reuse worn housing.

REASSEMBLY OF BEARING INSERT

1. Insert new bearing into loading slots (see **Figure 3**).
2. Torque bearing 90° (see **Figure 4**) and assure lube holes in the bearing are on the same side as lube groove in housing. Fit should be snug.
3. Install bearing via steps on **Page 1**.

DURA-KLEAN Units

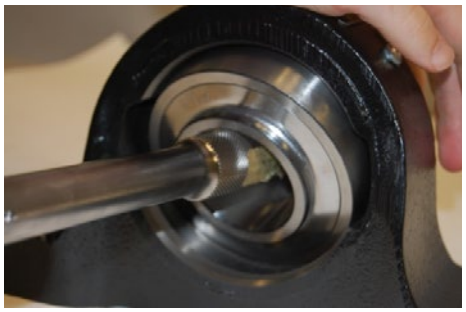
1. Bridge over housing mounting bolt holes or slots with heavy flat washers.
2. Flat washers must be used between the mounting bolts and housing surface to prevent damage to special Dura-Klean coating.
3. The use of heavy spring lockwashers between the bolt heads and flat washers is acceptable and considered good practice to prevent bolt loosening.

Tapped End Closure Installation

For UG300 only — insert the end closure tabs into the housing. Fill the gap between the end closure outer diameter and housing bore with a bead of silicone sealant/adhesive.

Figure 3 — Loading bearing into loading slots

Figure 4 — Torquing bearing 90° into housing



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UNMOUNTED BEARING MOUNTING PROCEDURE

Cylindrical O.D. Ball bearings (UB200, UBG200, WB200, WBG200, YB200, YBG200)

1. Inspect shaft (see Shaft Tolerance **Table 7**) and housing bore (see Housing Seat Diameter and Tolerance **Table 10**). Clean shaft, housing bore and mounting surface as needed.
2. Lubricate housing bores and shaft seats to facilitate with assembly. Back out any and all setscrews.
3. Depending on assembly sequence, insert bearings into housings and onto their shafts.
4. Position and assemble any snap rings or locating devices at this time.
5. Lock bearing to the shaft:

   Set Screw Lock (UB200, UBG200)
   Tighten the set collar set screws on the bearing to the proper tightening torque which can be found in the Set Screw Torque **Table 8**. Alternate torquing of the screws to prevent unequal loading. If an Allen wrench is used as a torque wrench, place a length of pipe over the long end and pull until the wrench begins to twist.

   Eccentric Cam Lock (WB200, WBG200, YB200, YBG200)
   Slide collar over the shaft until it rests over the cam of the inner ring. Rotate the collar in the direction of normal shaft rotation until snug. Utilizing a hammer and punch, rotate the collar until tight. Tighten set screws securely. Utilize torque values from Set Screw Torque **Table 8**. If an Allen wrench is used as a torque wrench, place a length of pipe over the long end and pull until the wrench begins to twist.
6. Check system for freedom of rotation. Any condition of abnormal sound, irregular rotational torque, or vibration may be due to improper installation. Installation should be checked and corrections made prior to operation.

SQUARE, ROUND, AND HEX BORE BEARINGS (R200, S200, & K200)

1. If installing in housing assemble bearing in housing. If installing cylindrical OD bearing in housing, exert pressure only to the outer ring. DO NOT strike or exert pressure on the seals or inner ring.
2. Inspect shaft. Shaft must be clean, straight and free of burrs.
3. Coat shaft and bearing bore with grease or oil to facilitate assembly of closely fitted bearings
4. Slide components on shaft in correct order.
5. Bolt housings or stampings lightly to the supports.
6. Tighten and secure locking devices.
7. Check system for freedom of rotation. Any condition of strain, abnormal sound, irregular rotational torque, or vibration may be due to improper installation. Installation should be checked and corrections made prior to operation.

TABLE 7 — Shaft Tolerance (Inches)

Shaft Diameter	Tolerance Nominal to:
1/2" – 2"	-0.0005"
2 1/16" – 4"	-0.001"

TABLE 8 — Set Screw Torque

Shaft Size (In.)	Seating Torque (in-lbs / N-m)		
	WB200	YB200	UB200
1/2 – 11/16	92 / 10.4	92 / 10.4	40 / 4.5
3/4	92 / 10.4	92 / 10.4	92 / 10.4
13/16 – 1	92 / 10.4	92 / 10.4	92 / 10.4
1 1/16 – 1 3/16	185 / 20.9	185 / 20.9	92 / 10.4
1 1/4 – 1 7/16	325 / 36.7	325 / 36.7	185 / 20.9
1 1/2 – 1 9/16	325 / 36.7	325 / 36.7	185 / 20.9
1 5/8 – 1 3/4	325 / 36.7	325 / 36.7	185 / 20.9
1 13/16 – 1 15/16	325 / 36.7	325 / 36.7	325 / 36.7
2 – 2 3/16	460 / 52.0	460 / 52.0	325 / 36.7
2 1/4 – 2 7/16	460 / 52.0	460 / 52.0	325 / 36.7

LUBRICATION INFORMATION

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RELUBRICATION

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At High temperatures, greases tend to degrade more rapidly and thus require fresh grease more frequently. In general, small amounts of grease added frequently provide better lubrication. When equipment will not be in operation for some time, grease should be added to provide corrosion protection. This is particularly important for equipment exposed to severe weather.

AUTOMATIC LUBRICATION SYSTEMS

A variety of automatic re-lubrication systems are available for use with ball bearings. Key considerations are:

1. NLGI grade of grease used, consistent with system layout
2. An amount/frequency combination necessary to replenish the grease

MIXING OF GREASES

Mixing of any 2 greases should be checked with the lubricant manufacturer.

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Housing Bearing Seat Diameters for Cylindrical O.D. Ball Bearings

TABLE 9 — Class of Fit Selection

Housing Construction	Operating Condition			Class of Fit*	Remarks
Housing not split radially	Housing rotating in relation to direction of load	Normal and heavy loads		N6	Outer ring not axilly displaceable
		Light loads		M6	
	Direction of load indeterminate	Heavy shock loads			
		Normal and heavy loads where outer ring does not have to be axially displaceable		K6	Outer ring, as a rule, not axially displaceable
Housing split or not split radially		Normal and light loads where displaceability of outer ring is desirable		J6	Outer ring, as a rule axially displaceable
	Housing stationary in relation to direction of loads	Shock loads temporary complete unloading			
		All loads	Housing not split radially	H6	Outer ring is easily displaceable axially
			Housing split radially	H7	

* For cast iron or steel housings. For housings of light metal, select tolerances which give slightly tighter fits than those shown.

TABLE 10 — Class of Fit and Housing Bores (Inches/µm)

Basic Size			Nominal Bearing O.D. and Housing Bore		Bearing O.D. Tolerance △	Bearing/Housing Diameter Fits ▲											
						H7		H6		J6		K6		M6		N6	
W200 Y200 U200 C200	R200 S200 K200					Tolerance		Tolerance		Tolerance		Tolerance		Tolerance		Tolerance	
			mm	Inches		Fit	Housing Bore	Fit	Housing Bore	Fit	Housing Bore	Fit	Housing Bore	Fit	Housing Bore	Fit	Housing Bore
2M17	211	203	40	1.5748	0	0	0	0	0	.0002T	-0.0002	.0005T	-0.0005	.0008T	-0.0008	.0011T	-0.0011
					-0.0005	.0015L	0.001	+.0011L	0.0006	.0009L	0.0004	.0006L	0.0001	.0003L	-0.0002	0	-0.0005
2M20	212	204	47	1.8504	0	0	0	0	0	5T	-5	13T	-13	20T	-20	28T	-28
					-13	38L	25	28L	15	23L	10	15L	2	8L	-5	0	-13
2M25	216	205	52	2.0472	0	0	0	0	0	.0002T	-0.0002	.0006T	-0.0006	.0010T	-0.001	.0013T	-0.0013
2M30	219	206	62	2.4409	-0.0005	.0017L	0.0012	.0012L	0.0007	.0010L	0.0005	.0006L	0.0001	.0002L	-0.0003	.0001T	-0.0006
2M35	223	207	72	2.8346	0	0	0	0	0	5T	-5	15T	-15	25T	-25	33T	-43
2M40	225	208	80	3.1496	-13	43L	30	30L	17	26L	13	15L	2	5L	-8	2T	-15
2M45	228	209	85	3.3465	0	0	0	0	0	.0002T	-0.0002	.0007T	-0.0007	.0012T	-0.0012	.0016T	-0.0016
2M50	231	210	90	3.5433	-0.0006	.0020L	0.0014	.0015L	0.0009	.0013L	0.0007	.0008L	0.0002	.0003L	-0.0003	.0001T	-0.0007
2M55	235	211	100	3.937	0	0	0	0	0	5T	-5	18T	-18	30T	-30	40T	-40
2M60	239	212	110	4.3307	-15	50L	35	38L	23	33L	18	20L	5	8L	-8	3T	-18

Please consult for availability.
1µm = .001 mm
The appropriate housing bore for any class of fit can be easily determined by applying the housing tolerance to the nominal housing bore.
Example, (using basic size 211 and class of fit H7):

		Inches		mm	
Normal Housing Bore	=	1.5748	1.5748	40.000	40.000
Housing Bore Tolerance	=	– .0000	+ .0010	-0.000	+ 0.025
Resultant Housing Bore	=	1.5748	1.5758	40.000	40.025

Symbol **L** indicates a loose or clearance fit.
Symbol **T** indicates a tight or interference fit.
▲ The arithmetical mean of the largest and smallest single diameter to be within tolerance shown. Allowable deviation from mean diameter
△ per ANSI/ABMA Standard 20, latest printing.

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LIMITED WARRANTY – LIABILITY

A. IT IS EXPRESLY AGREED THAT THE FOLLOWING WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTOR. INCLUDING THOSE OF **MERCHANTABILITY** AND FITNESS FOR A PATICULAR PURPOSE, AND OF ANY OTHER OBLIGATION OR LIABILITY ON OUR PART OF ANY KIND OR NATURE WHATSOEVER.

No representative of ours has any authority to waive, alter, vary, or add to the terms hereof without prior approval in writing, to our customer, signed by an officer of our company. It is expressly agreed that the entire warranty given to the customer is embodied in this writing. This writing constitutes the final expression of the parties agreement with respect to warranties, and that it is a complete and exclusive statement of the terms of the warranty.

We warrant to our customers that all Products manufactured by us will be free from defects in material and workmanship at the time of shipment to our customer for a period of one (1) year from the date of shipment. All warranty claims must be submitted to us within ten days of discovery of defects within the warranty period, or shall be deemed waived. As to Products or parts thereof that are proven to have been defective at the time of shipment, and that were not damaged in shipment, the sole and exclusive remedy shall be repair or replacement of the defective parts or repayment of the proportionate purchase price for such Products or part, at our option. Replacement parts shall be shipped free of charge f.o.b. from our factory.

This warranty shall not apply to any Product which has been subject to misuse; misapplication, neglect (including but not limited to improper maintenance and storage); accident, improper installation, modification (including but not limited to use of unauthorized parts or attachments), adjustment, repair or lubrication. Misuse also includes, without implied limitation, deterioration in the Product or part caused by chemical reaction, wear caused by the presence of abrasive materials, and improper lubrication. Identifiable items manufactured by others but installed in or affixed to our Products are not warranted by use but, bear only those warranties, express or implied, given by the manufacturer of that item, if any. Responsibility for system design to insure proper use and application of Link-Belt® Products within their published specifications and ratings rests solely with customer. This includes without implied limitation analysis of loads created by torsional vibrations within the entire system regardless of how induced.

B. It is expressly agreed that our liability for any damage arising out of or related to this transaction, or the use of our Products, whether in contract or in tort, is limited to the repair or replacement of the Products, or the parts thereof by use, or to a refund of the proportionate purchase price. We will not be liable for any other injury, loss, damage, or expense, whether direct or consequential, including but not limited to use, income, profit, production, or increased cost of operation, or spoilage of or damage to material, arising in connection with the sale, installation, use of, inability to use, or the replacement of, or late delivery of, our Products.

RegalRexnord™