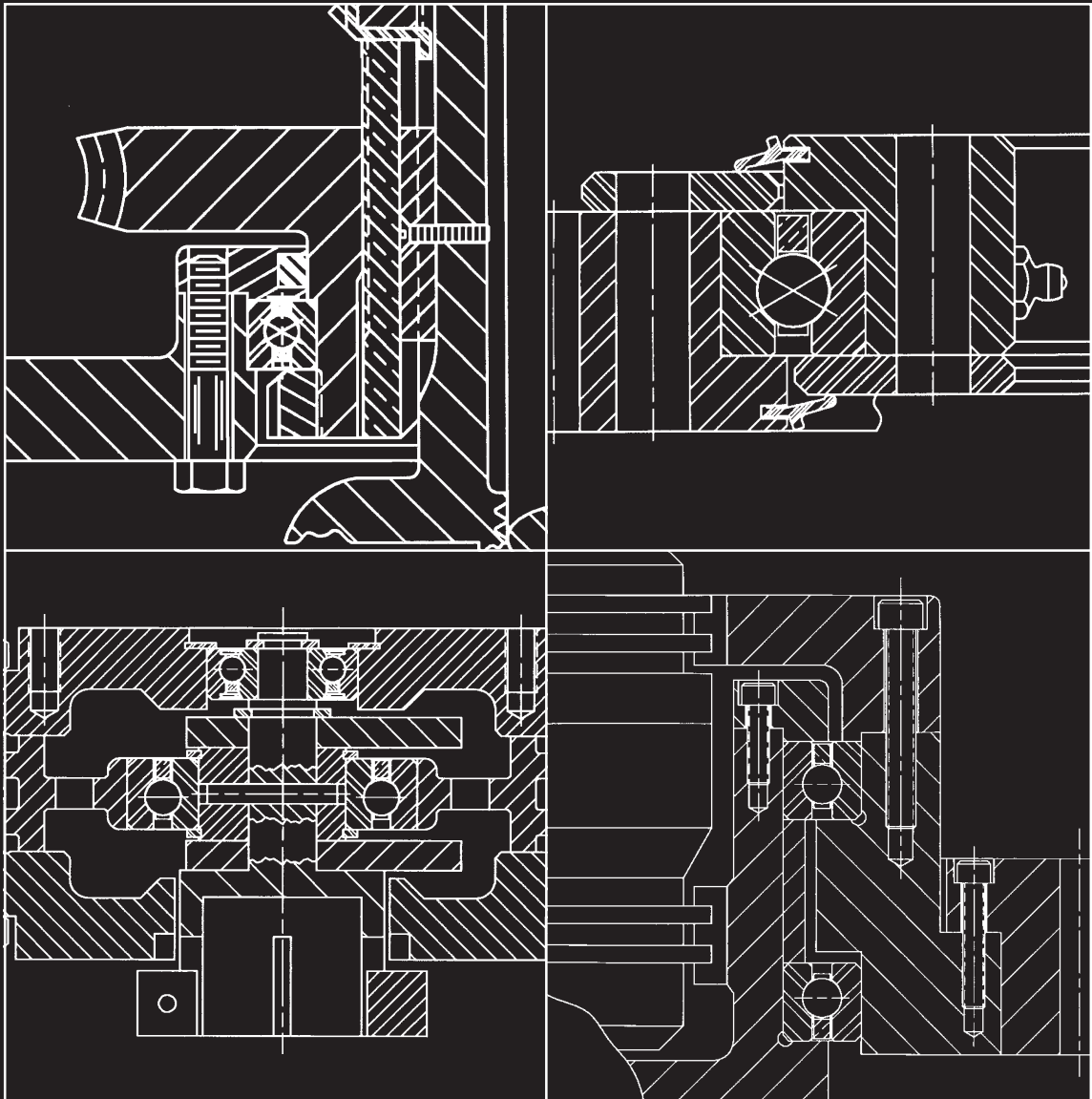


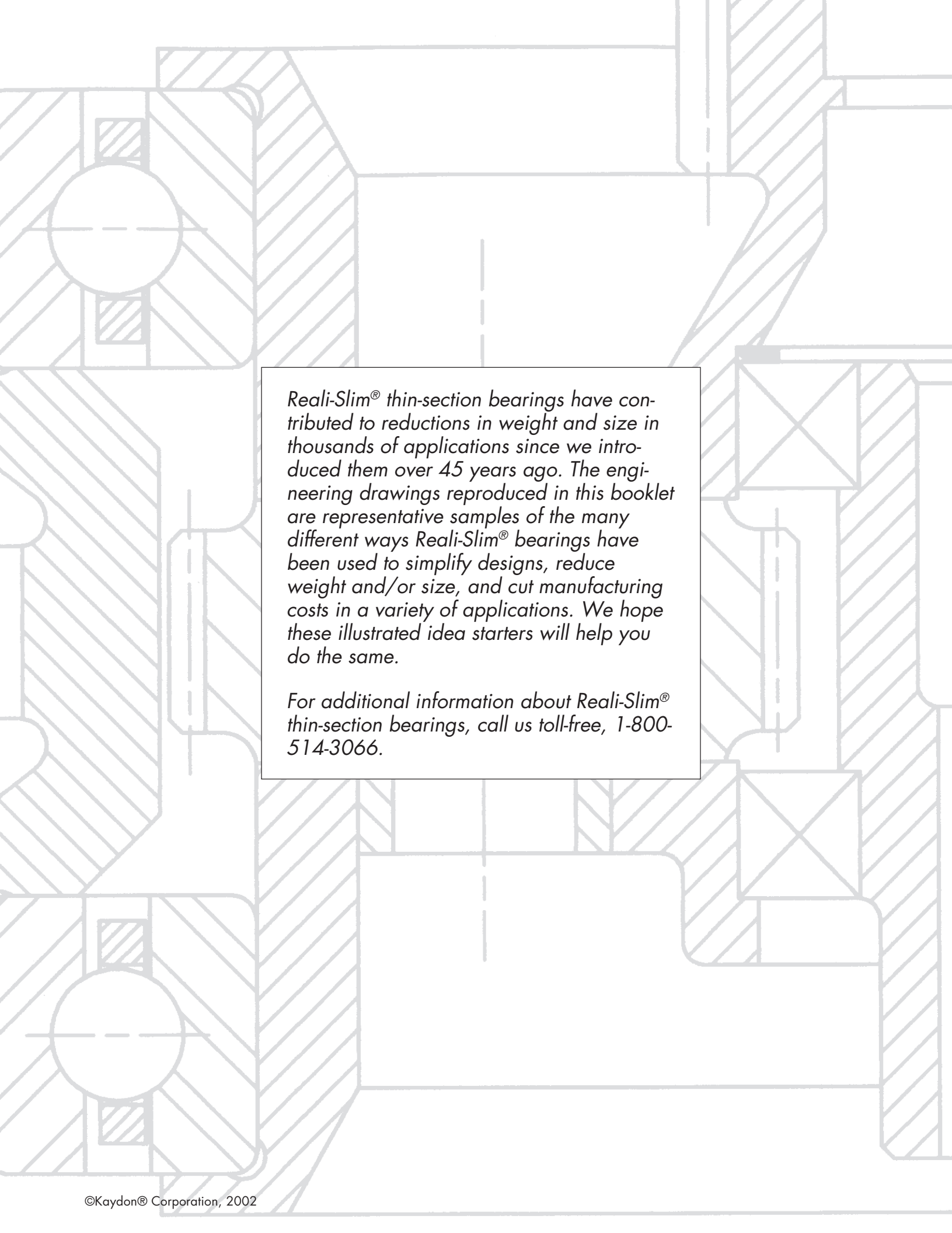
# ENGINEERED SOLUTIONS

Based on Reali-Slim® Bearings

AN ILLUSTRATED MOUNTING GUIDE

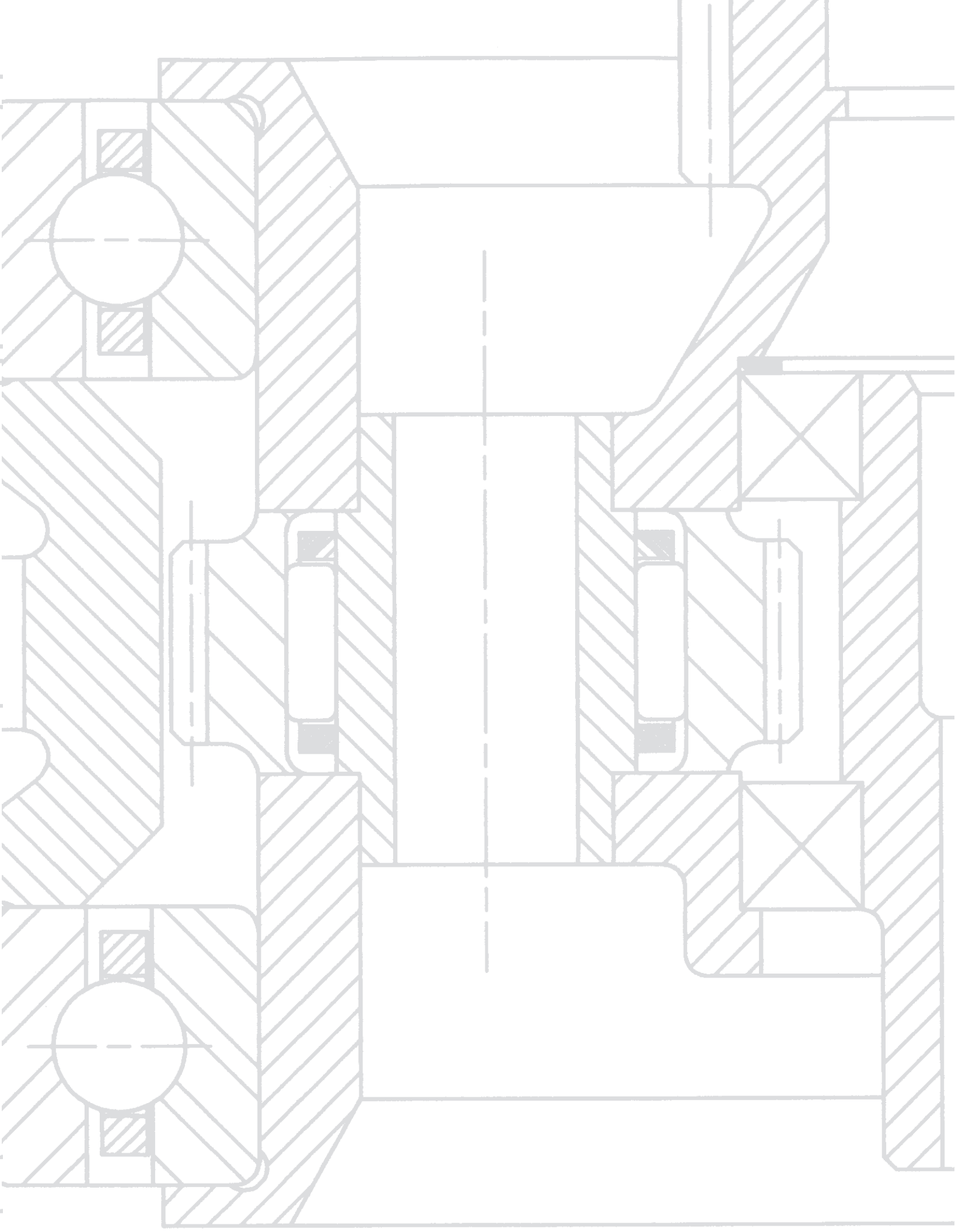


KAYDON®

The background of the page is a technical drawing showing a cross-section of a mechanical assembly. It features various components with different hatching patterns: diagonal lines for one material, cross-hatching for another, and a central circular component. The drawing is rendered in a light gray color.

*Reali-Slim® thin-section bearings have contributed to reductions in weight and size in thousands of applications since we introduced them over 45 years ago. The engineering drawings reproduced in this booklet are representative samples of the many different ways Reali-Slim® bearings have been used to simplify designs, reduce weight and/or size, and cut manufacturing costs in a variety of applications. We hope these illustrated idea starters will help you do the same.*

*For additional information about Reali-Slim® thin-section bearings, call us toll-free, 1-800-514-3066.*



# Bearing Application Data

Copy, fill out and fax to 213-759-4102

Please answer the questions on this form as completely as possible. Include a drawing (or sketch) of the application if available. Be sure to show all parts and information relevant to the application. The data you supply is the basis for our recommendations.

TO \_\_\_\_\_ Kaydon Corporation  
Muskegon, Michigan 49443  
Fax: 231/759-4102  
Date \_\_\_\_\_

FROM \_\_\_\_\_ Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_ Telephone \_\_\_\_\_  
Address \_\_\_\_\_ Email \_\_\_\_\_  
Application \_\_\_\_\_ Project \_\_\_\_\_  
Experimental  Prototype  Production  Special Machine  Other   
Quantity \_\_\_\_\_ Original Equipment Manufacturer  Resale  Own Use  Replacement

LOADS \_\_\_\_\_ Static Radial (Max.) \_\_\_\_\_ Dynamic Radial (Mean) \_\_\_\_\_  
Static Thrust (Max.) \_\_\_\_\_ Dynamic Thrust (Mean) \_\_\_\_\_  
Static Moment (Max.) \_\_\_\_\_ Dynamic Moment (Mean) \_\_\_\_\_  
If mean dynamic loads are unknown, attach all conditions with percent of time each occurs.  
Vibration or shock \_\_\_\_\_ Describe \_\_\_\_\_  
Factor of Safety of \_\_\_\_\_ (is) (is not) included in loads above.

SPEED \_\_\_\_\_ RPM (Max.) \_\_\_\_\_ RPM (Mean) \_\_\_\_\_ or attach conditions with percent of time.

OSCILLATION \_\_\_\_\_ Angle \_\_\_\_\_° Frequency \_\_\_\_\_

ACCURACY \_\_\_\_\_ Kaydon Precision Class \_\_\_\_\_ or:  
Permissible Eccentricity: Inner \_\_\_\_\_ Outer \_\_\_\_\_  
Permissible Face Run-Out: Inner \_\_\_\_\_ Outer \_\_\_\_\_  
Permissible Looseness: Radial \_\_\_\_\_ Axial \_\_\_\_\_

LIFE \_\_\_\_\_ Hours (Min. \_\_\_\_\_ Hours (Avg.) \_\_\_\_\_ Other \_\_\_\_\_

TEMPERATURE \_\_\_\_\_ Normal Operating \_\_\_\_\_°F Minimum \_\_\_\_\_°F Maximum \_\_\_\_\_°F.  
Differential between shaft and housing \_\_\_\_\_°F.

LUBRICATION \_\_\_\_\_ Proposed Lubricant \_\_\_\_\_ and method \_\_\_\_\_

BEARING \_\_\_\_\_ Preferred Size: Bore \_\_\_\_\_ Outside Dia. \_\_\_\_\_ Width \_\_\_\_\_  
Min. Bore \_\_\_\_\_ Max. Outside Dia. \_\_\_\_\_ Max. Width \_\_\_\_\_

Preferred Type: \_\_\_\_\_

Bearing Axis in (Vertical) (Horizontal) position with (outer) (inner) race rotation relative to load.

MATERIAL \_\_\_\_\_ Shaft \_\_\_\_\_ Housing \_\_\_\_\_

SPECIAL \_\_\_\_\_ Allowable Bearing Torque \_\_\_\_\_

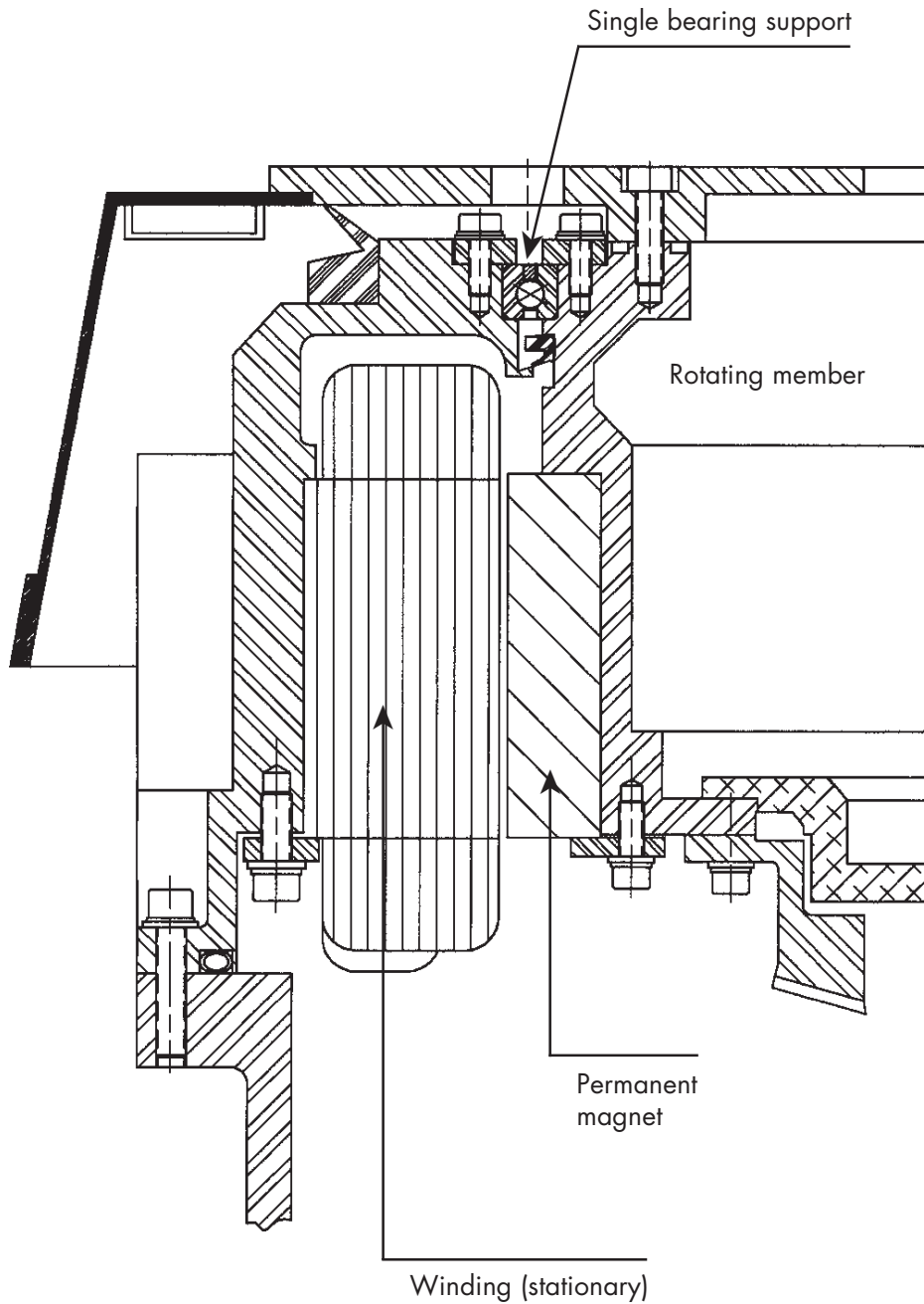
REQUIREMENTS \_\_\_\_\_ Sealing \_\_\_\_\_

Protective Coating \_\_\_\_\_

Other \_\_\_\_\_

REMARKS \_\_\_\_\_

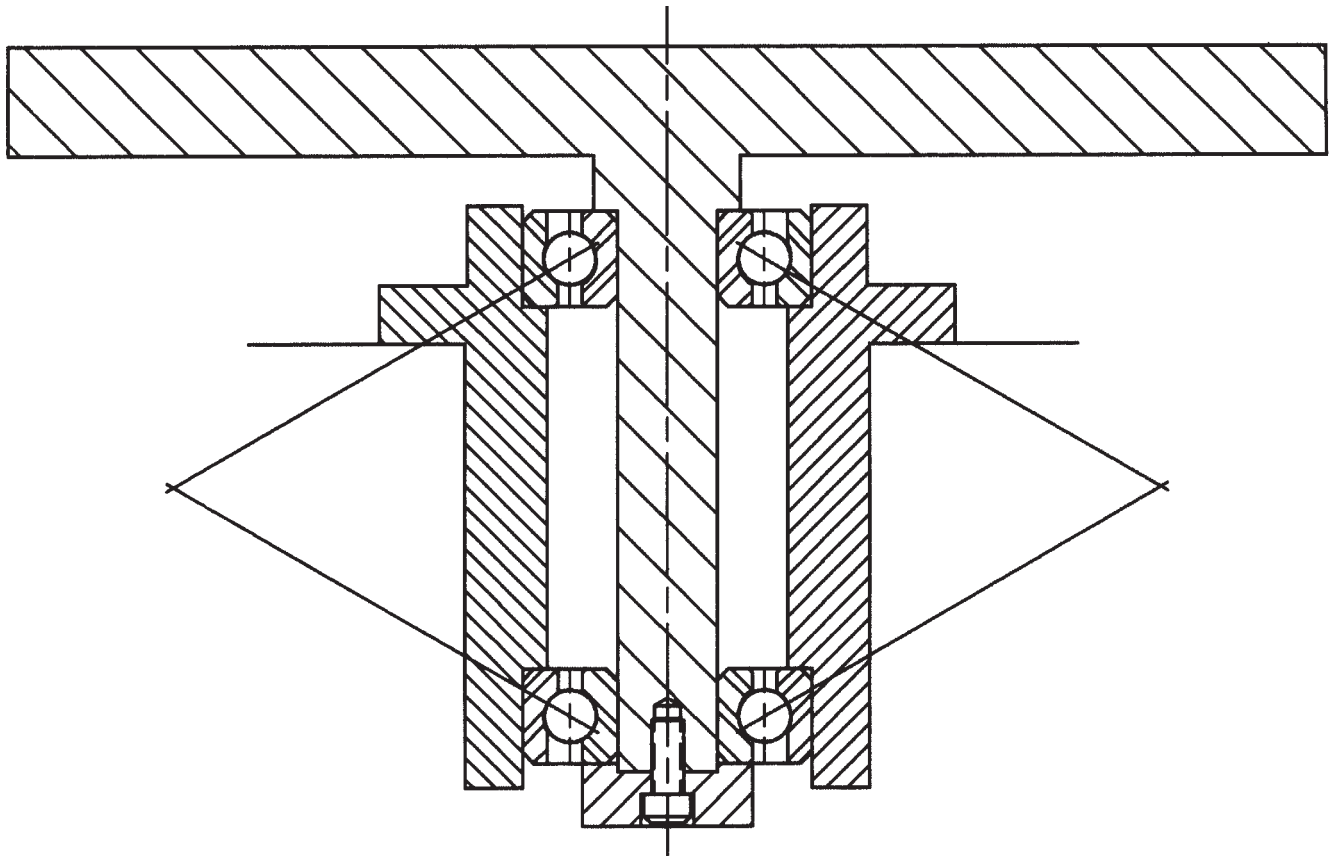
**For direct shaftless motor drives** a single 4-point contact bearing provides the required combination of radial, thrust, and moment loads.



KAYDON CORPORATION	
<b>DIRECT SHAFTLESS MOTOR DRIVE FOR ANTENNA</b>	
BEARINGS USED:	KD140XPOA
MACHINERY	

**How to use Reali-Slim® bearings for more design flexibility.**

Reali-Slim® bearings let you replace a small solid shaft (king post), as shown below, with a larger diameter hollow shaft. This gives you the freedom to run air and hydraulic lines, or electrical wiring and slip rings through the shaft, as shown on opposite page.

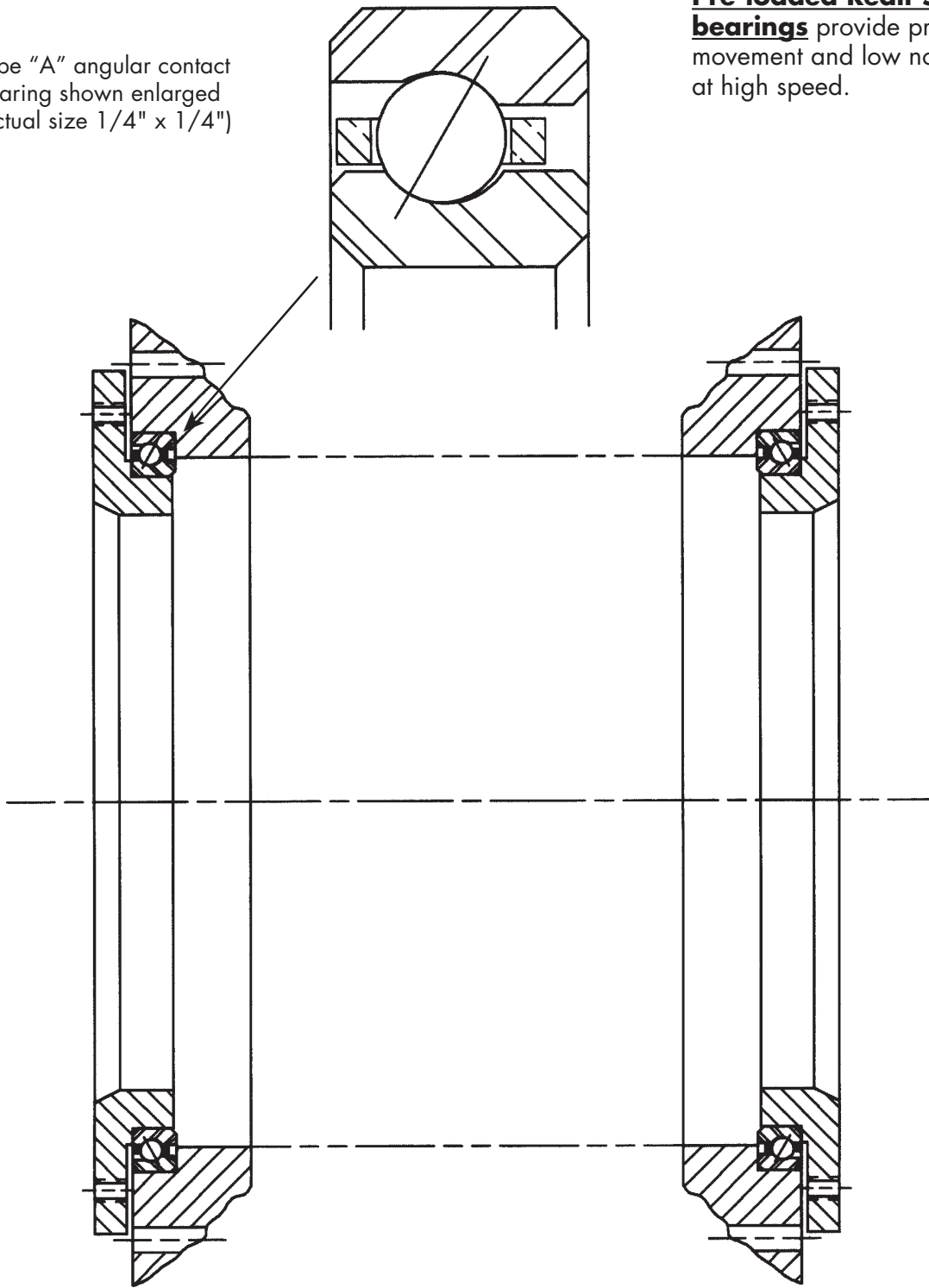


**Traditional Design**

Typical solid-shaft (king post) design using two conventional bearings. Overweight, expensive, and bulky. Limits design options.

Type "A" angular contact bearing shown enlarged (actual size 1/4" x 1/4")

**Pre-loaded Reali-Slim® bearings** provide precision movement and low noise levels at high speed.



Type "A" angular bearing  
Left side

Type "A" angular bearing  
Right side

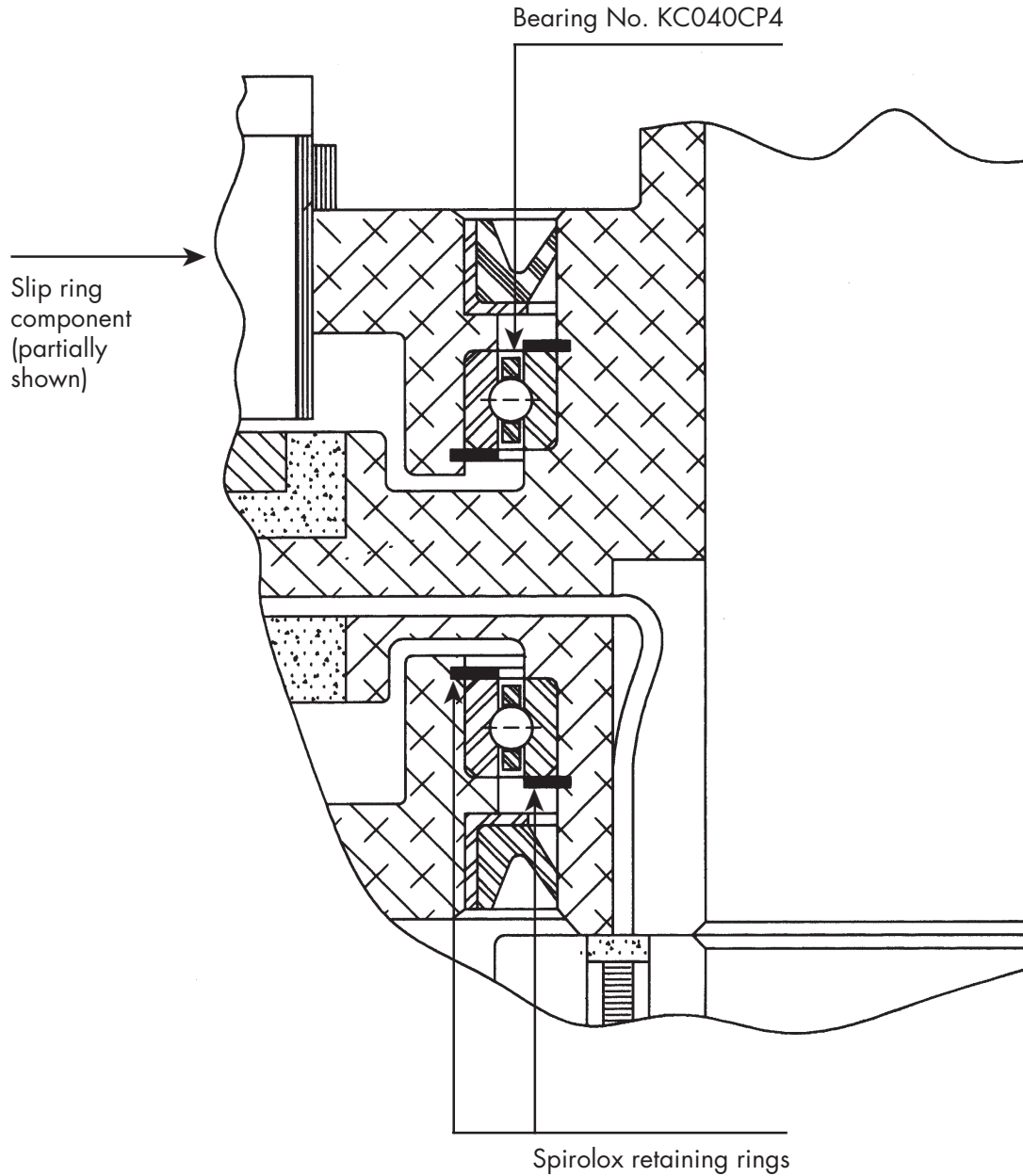
**Note:** left side is pre-loaded against right side of bearing during assembly.

KAYDON CORPORATION	
<b>Gimbal (Tailstock) Assembly For Drum Scanner</b>	
BEARINGS USED:	KA040AR0
BEARING ASSEMBLIES	

**Slip rings are engineered into a bearing assembly**

where electrical or RF signals must be transmitted through a rotating member.

Many bearing-slip ring assemblies also provide internal clearance for air and hydraulic lines to pass through a hollow shaft.



KAYDON CORPORATION

**SLIP RING ASSEMBLY**

BEARING SHOWN:

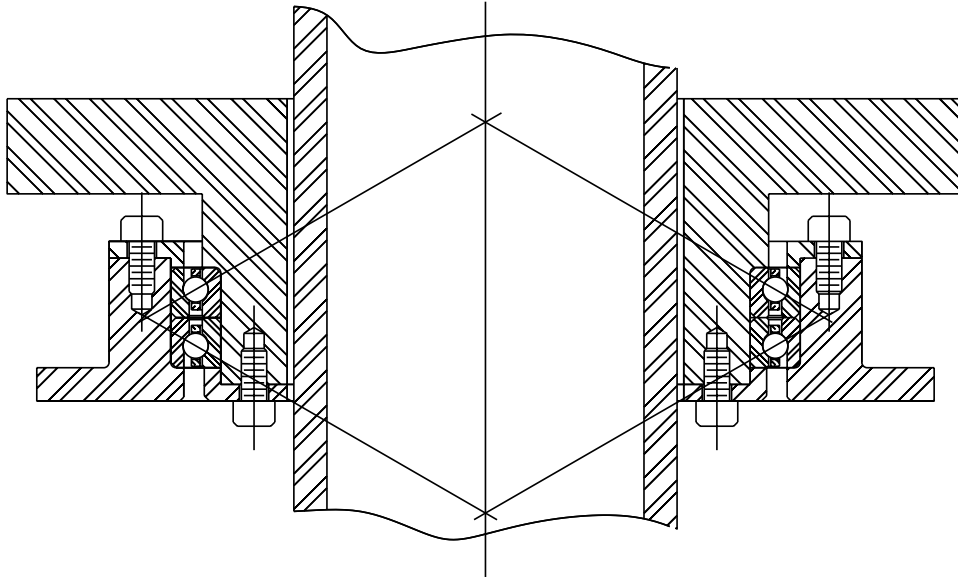
KC040CP4 4.00" bore x 4.75" O.D. x .375" radial section

BEARING ASSEMBLIES

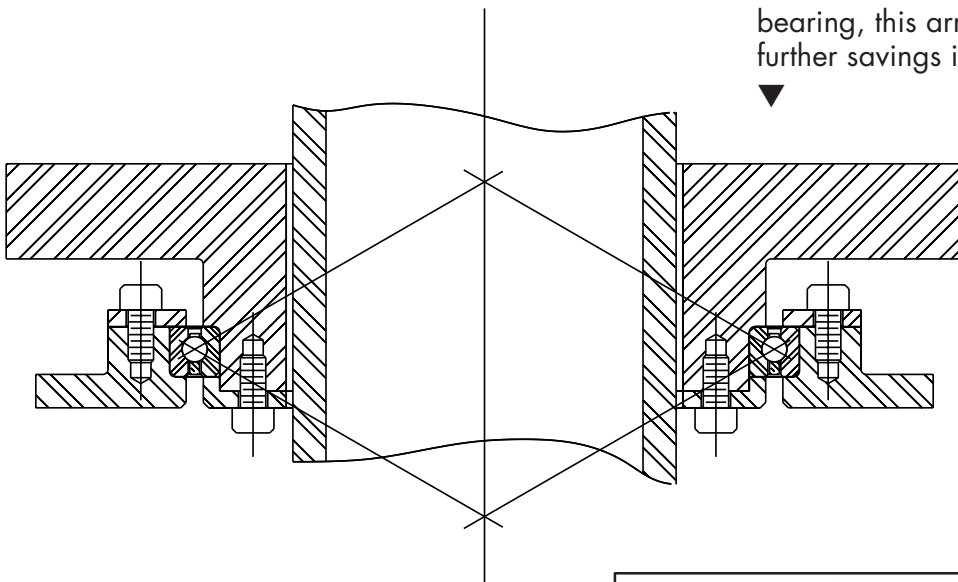


**How to use Reali-Slim® bearings for more design flexibility.**

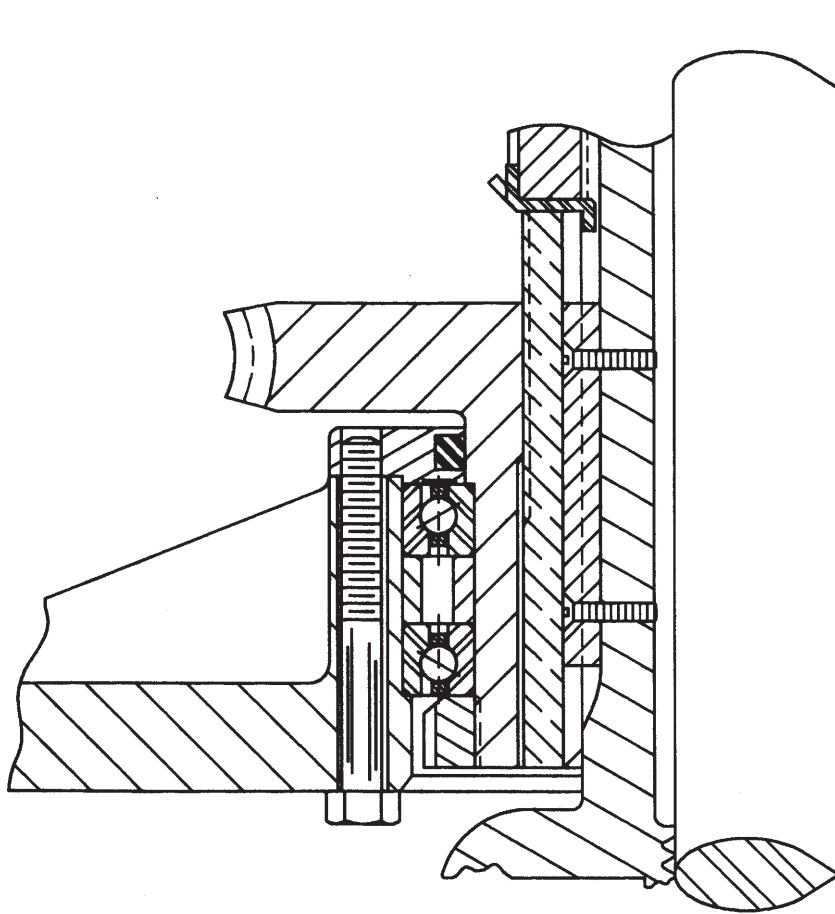
A large bore, small cross-section Reali-Slim® bearing permits the use of a large diameter hollow shaft in place of a smaller solid shaft. Components such as air and hydraulic lines or electrical wiring and slip rings can then be accommodated within the hollow shaft, resulting in a neater, more efficient design.



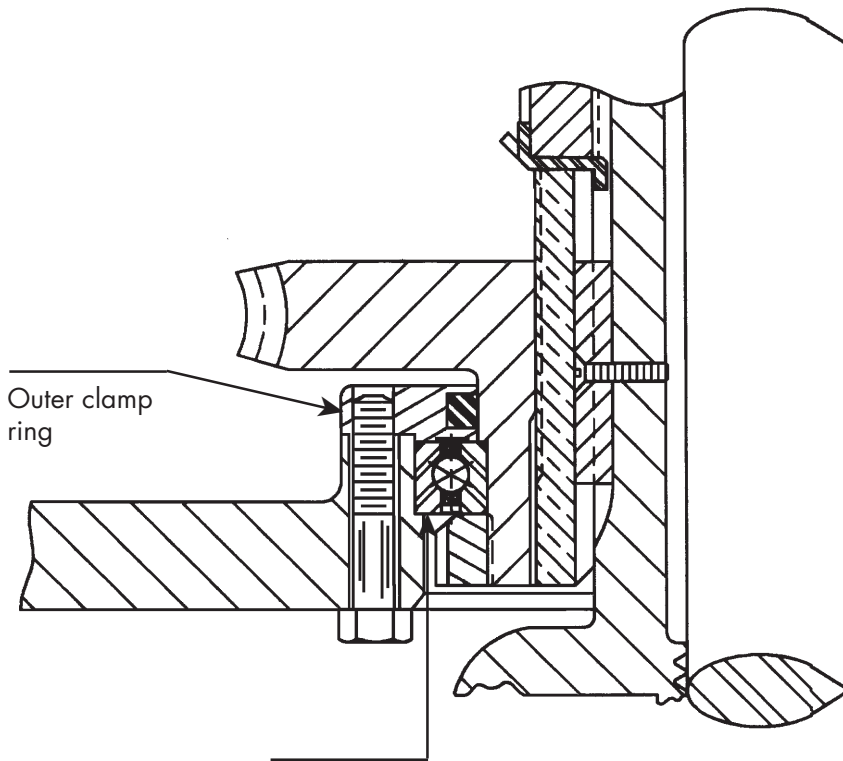
In many applications, a single 4-point contact Reali-Slim® bearing can replace two bearings, compacting the design and simplifying the bearing mounting. Besides the obvious cost savings of eliminating one bearing, this arrangement also contributes further savings in weight and space.



KAYDON CORPORATION	
<b>LIGHT WEIGHT, COMPACT DESIGNS</b>	
BEARINGS USED	REALI-SLIM® THIN-SECTION
IMPROVED DESIGN #1	



◀ **Before:** Two angular contact bearings of 10.000" bore x 12.000" O.D. x 1.000" cross-section were used.



◀ **After:** One 4-point contact bearing of 10.000" bore x 12.000" O.D. x 1.000" cross-section takes all radial and thrust loads. This reduces the size of the housing, eliminates parts, and lowers the cost of the entire unit.

Bearing No.  
KG100XP0

KAYDON CORPORATION

**Manually Adjustable Hydraulic Cylinder Stop Mechanism**

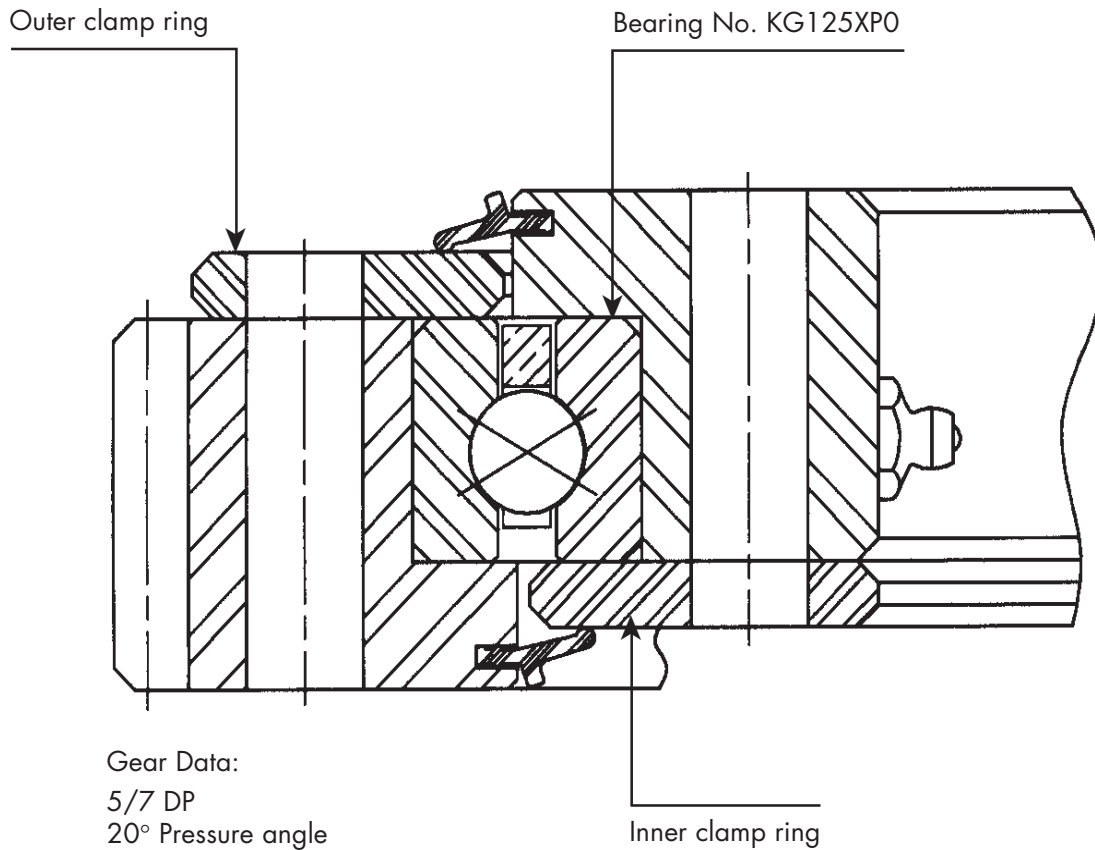
BEARING  
SHOWN:

KG100XP0 10.000" bore x 12.000" O.D.  
x 1.000" radial section

IMPROVED DESIGN #2

**Complete bearing assemblies can simplify your manufacturing**

Kaydon also provides complete bearing assemblies like the one shown. Options include internal or external gears, no gear, and contact seals.

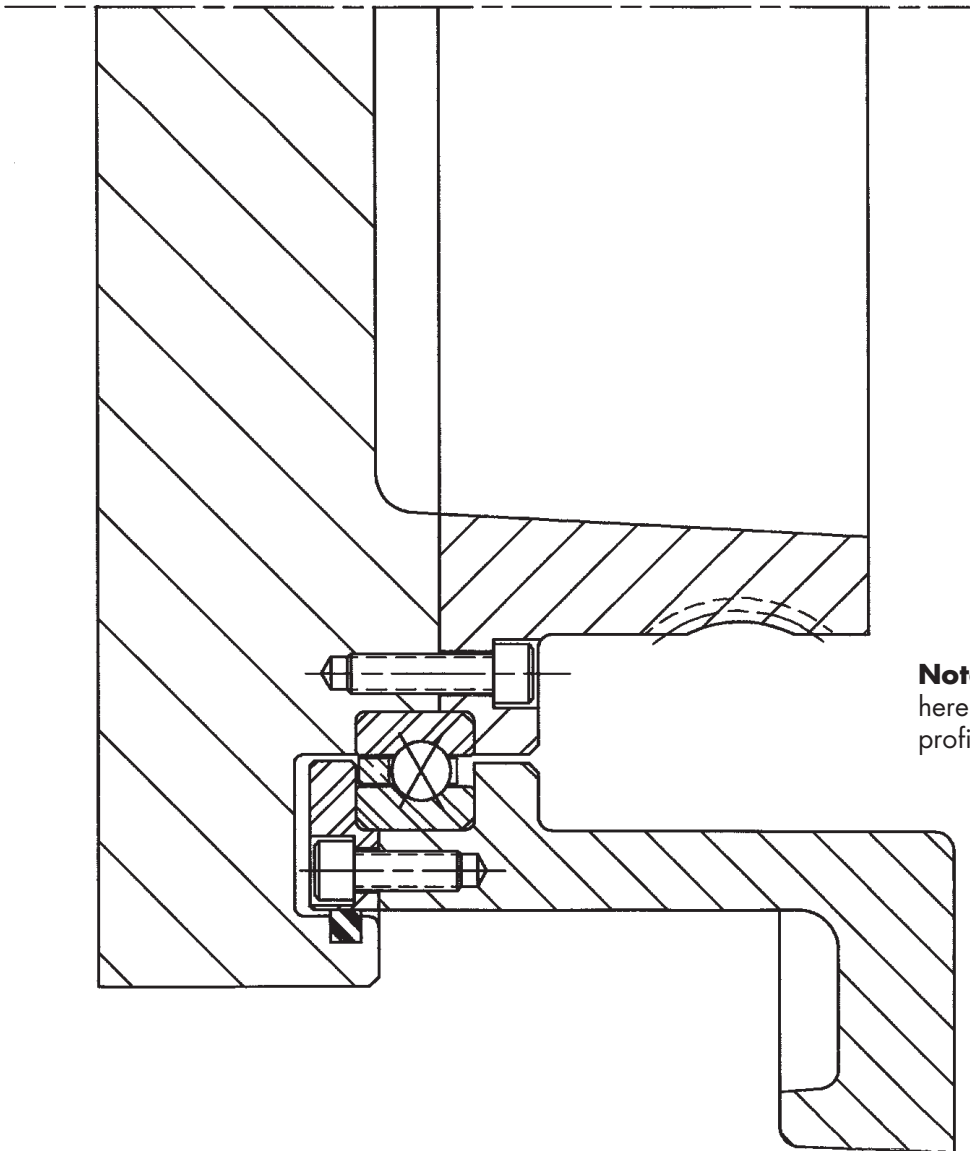


Gear Data:  
 5/7 DP  
 20° Pressure angle  
 84 Teeth  
 Type = Fellows stub

**Note:** through holes are used in bearing assembly which allow bolts to fasten to mounting structure.

KAYDON CORPORATION	
<b>GEARED HOUSING ASSEMBLY</b>	
BEARING SHOWN:	KG125XP0, 4-point contact Reali-Slim®
BEARING ASSEMBLIES	

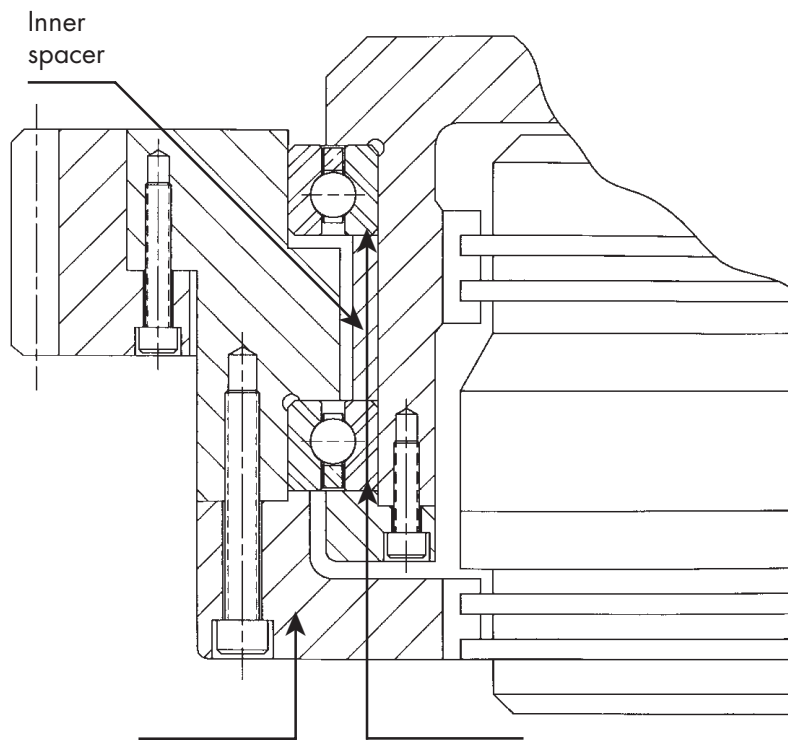
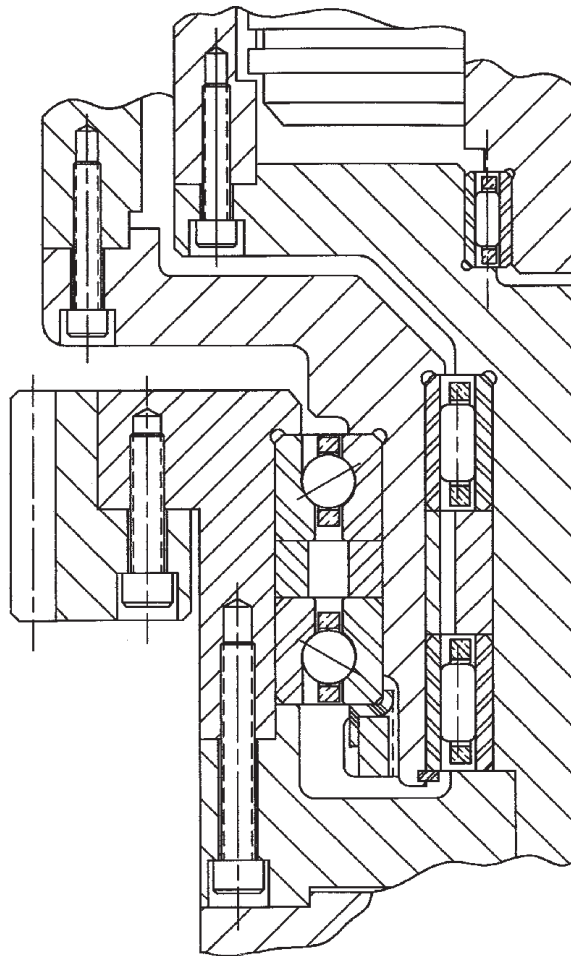
**For designing a product that will be manufactured in various sizes based on shaft diameter, Reali-Slim® bearings are ideal. Each bearing series has a cross-section which remains constant throughout all designs. So your bearing envelope stays the same for all product sizes.**



**Note:** X-type bearing is ideal here because of its compact profile.

KAYDON CORPORATION	
<b>PRECISION ROTARY TABLE</b>	
BEARINGS SHOWN:	KF090XP0 9" bore x 10.5" O.D. x .750" radial section
MACHINE TOOLS	

**Before:** Small bearings and ► spread-out design required more space and cost than revised design (below).



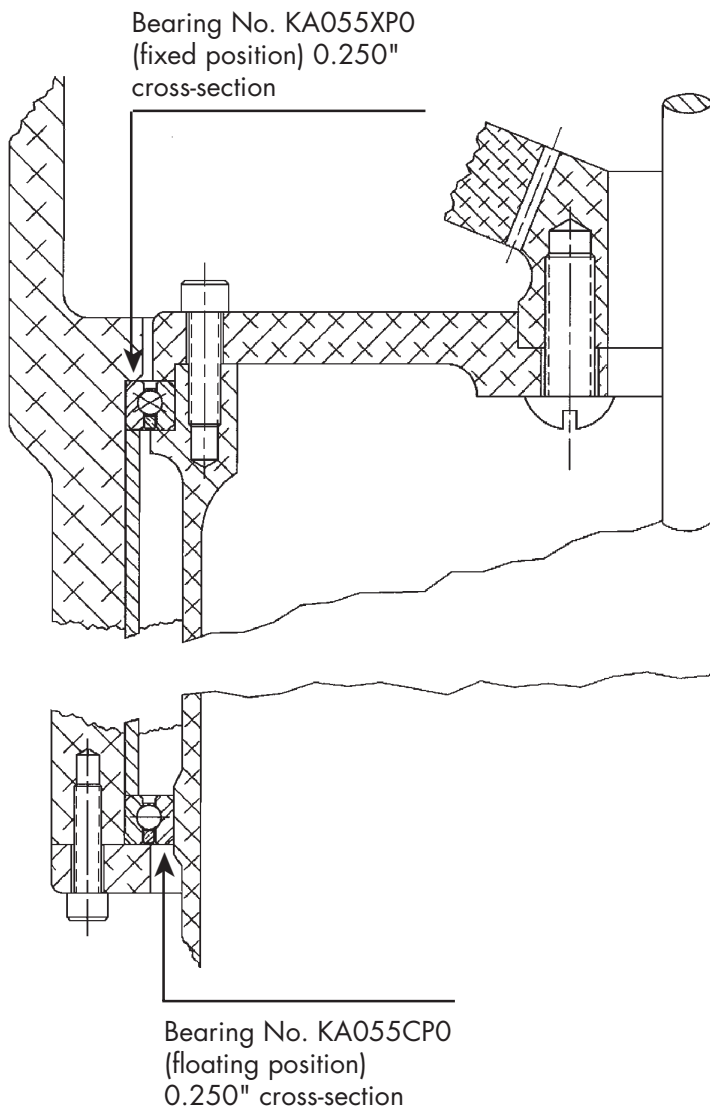
◀ **After:** Reali-Slim® bearings with a larger bore permit a more compact design and fewer parts, simplifying manufacturing and reducing costs.

<b>KAYDON CORPORATION</b>	
<b>CHAIN DRIVE TRANSMISSION</b>	
BEARING SHOWN:	KG090CP0 9.000" bore x 11.000" O.D. x 1.000" radial section
IMPROVED DESIGN #3	

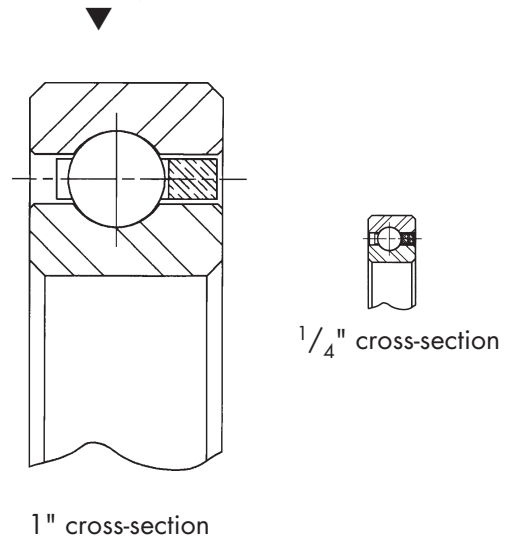
**Weight savings by a factor of 17:1.**

The 5 1/2" bore Reali-Slim bearing used in this design weighs only 0.25 pounds compared to a weight of 4.5 pounds for the standard 5 1/2" bore bearings which had been considered for the job. Housing weight of the design was also reduced.

**Note:** A Fixed-floating bearing mount is designed primarily for a centered radial load.



Drawing shows actual comparative bearing sizes. XLS 5 1/2" bearing (at left below) 5.000" x 7.500" x 1.000" shown for comparison.



<b>KAYDON CORPORATION</b>	
<b>RADAR ROTARY JOINT</b>	
BEARING SHOWN:	KA055XPO 5.500" bore x 6.00" O.D. x .250" radial section
SCALE: FULL	IMPROVED DESIGN #4

**Design shows integral bearing assembly** which includes SPIROLOX® retaining rings and external seals.

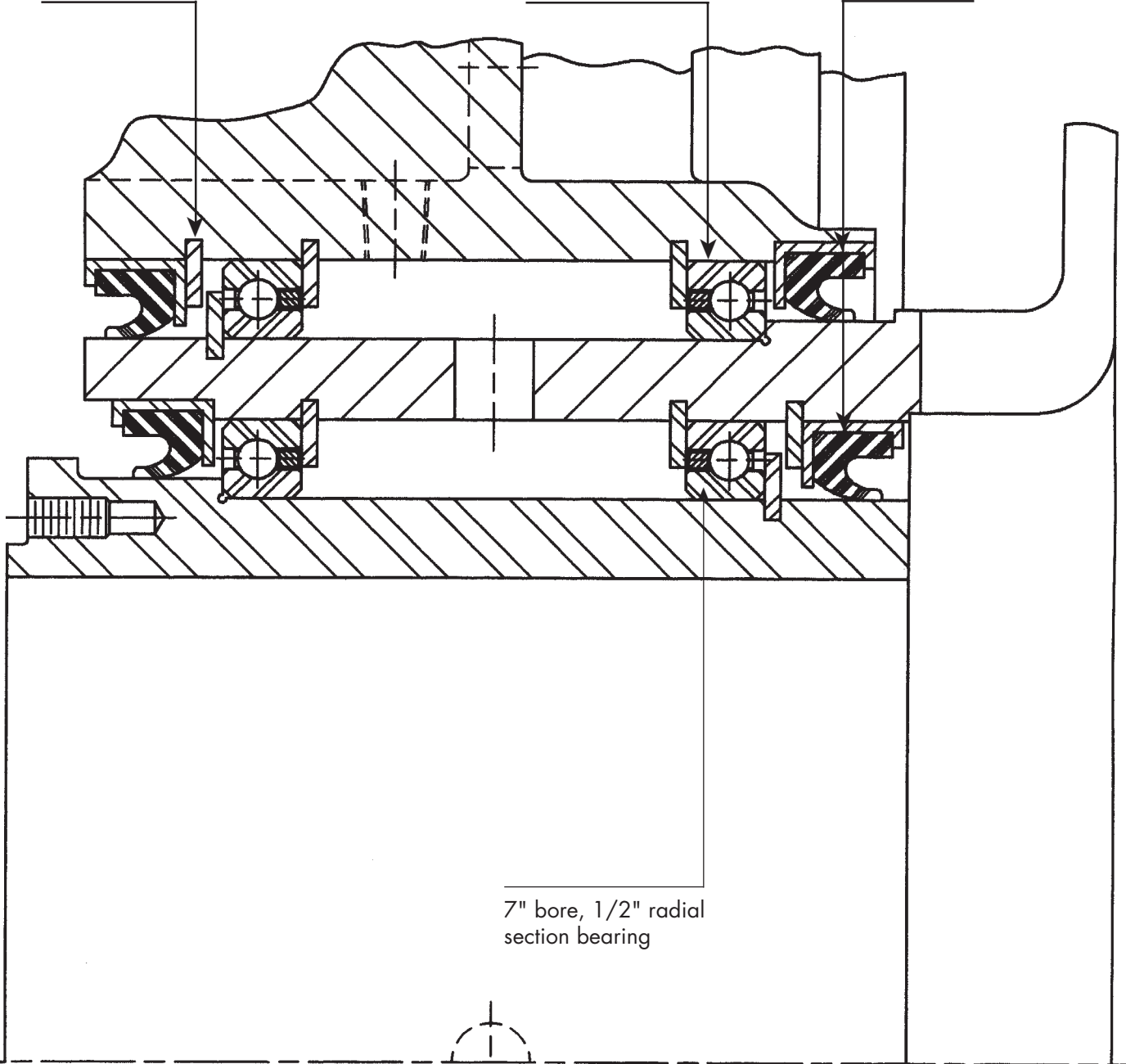
SPIROLOX®  
Retaining rings  
(8 places)

9" bore, 1/2"  
radial cross-section

External seals

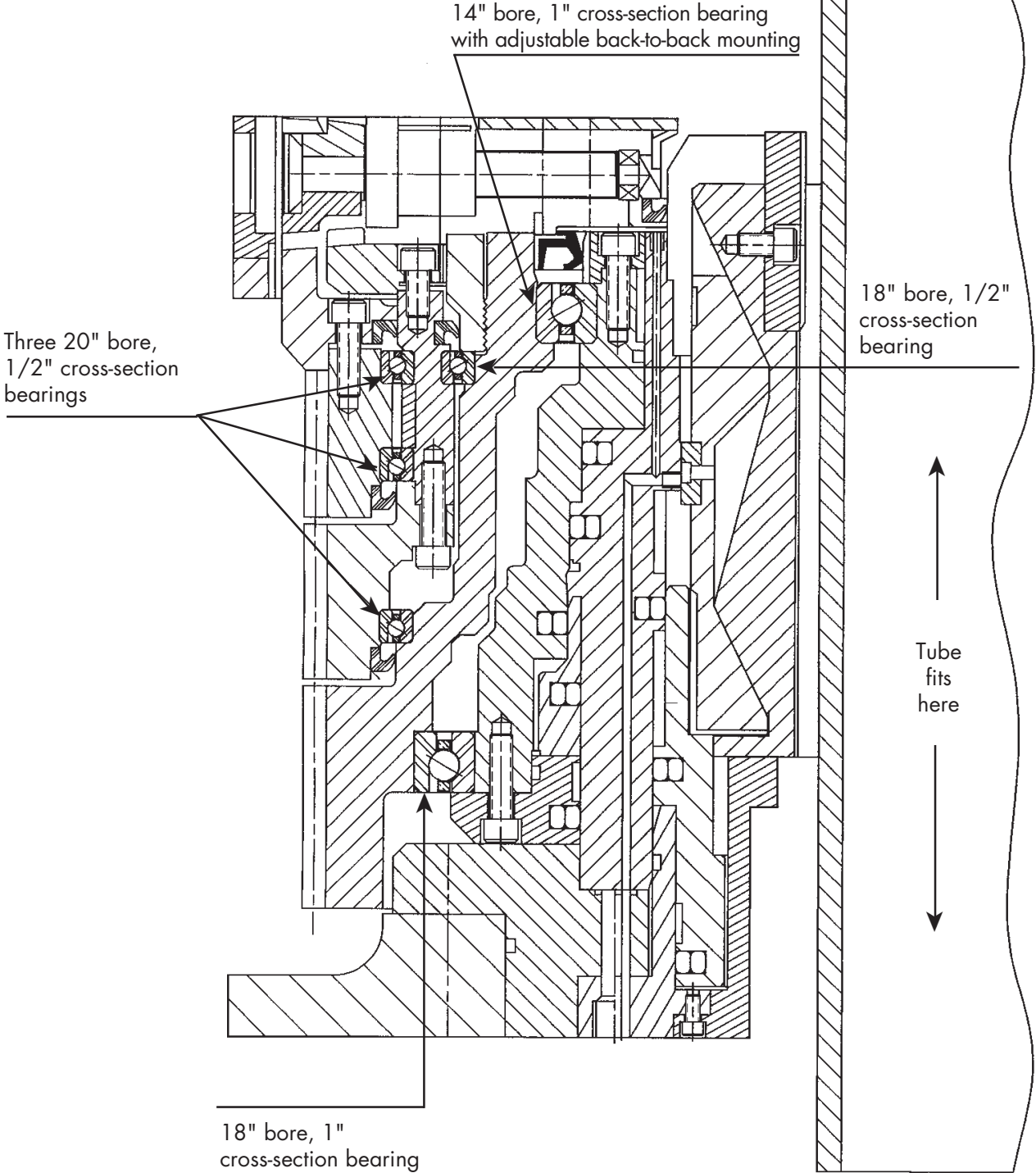
7" bore, 1/2" radial  
section bearing

Center line



KAYDON CORPORATION	
<b>CUTTING HEAD FOR PLASTIC PIPE CUTTER</b>	
CONCENTRIC BEARINGS:	KD070CP0, KD090CP0
SCALE: FULL	MACHINE TOOLS

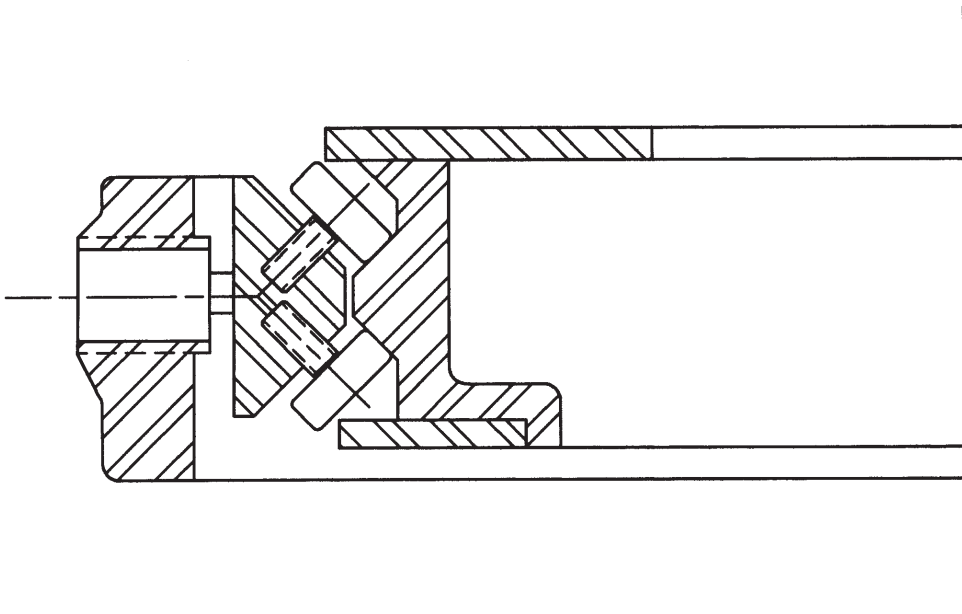
**Bearings of different cross-sections** complement one another. This design shows an adjustable back-to-back mounting of 14" and 18" bore bearings.



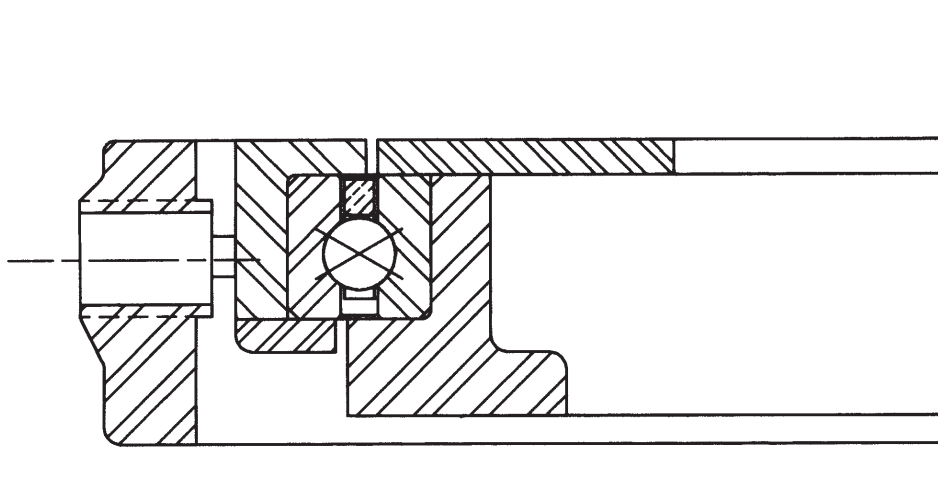
**NOTE:** Thin section, large bore bearings add stiffness to design.

KAYDON CORPORATION	
<b>TUBE CUTTING MACHINE</b>	
BEARINGS USED:	KG140AR0, KD180AR0, KG180AR0, KD200AR0 (3)
MACHINE TOOLS	





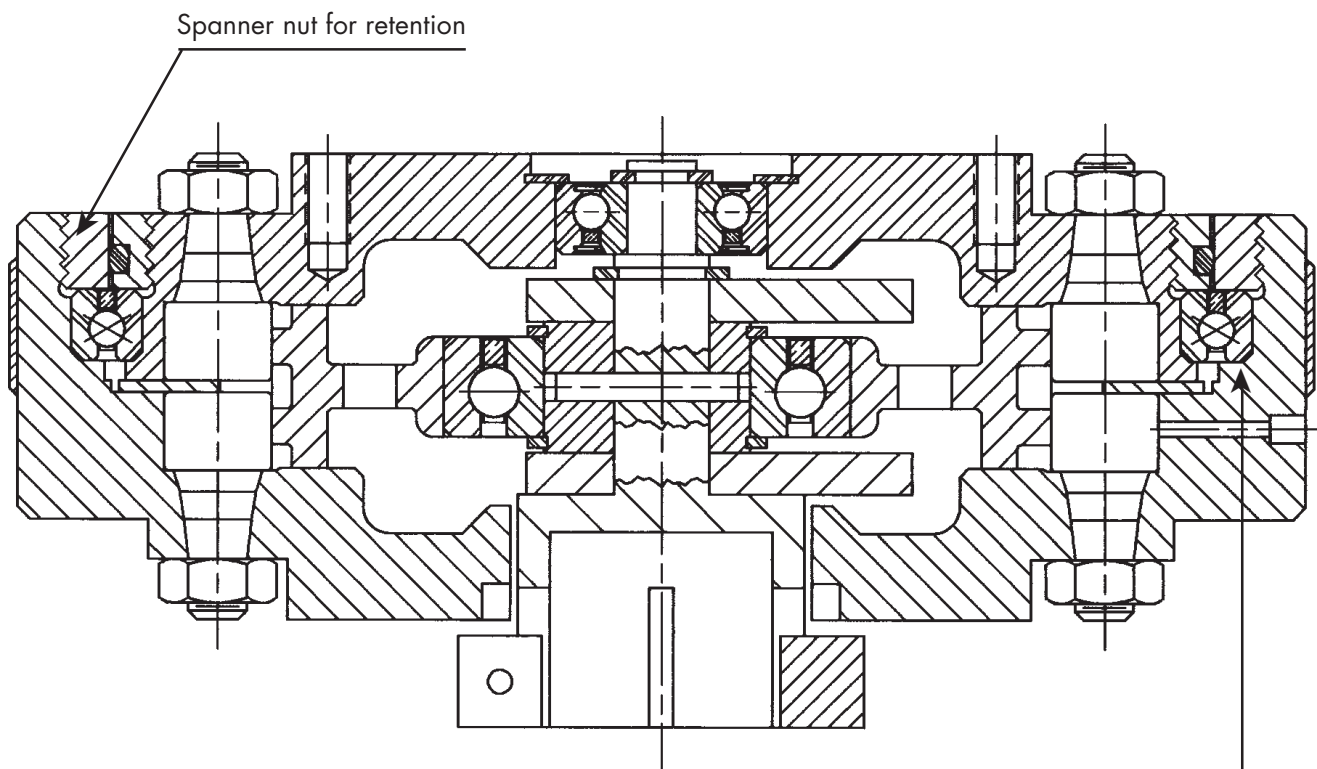
◀ **Before:** This bench lathe for glass working used a 3-point support consisting of cam rollers which did not provide the required accuracy and operating characteristics.



◀ **After:** Reali-Slim® bearings provided greater rigidity and precision within the same available space and resulted in a simplified mounting.

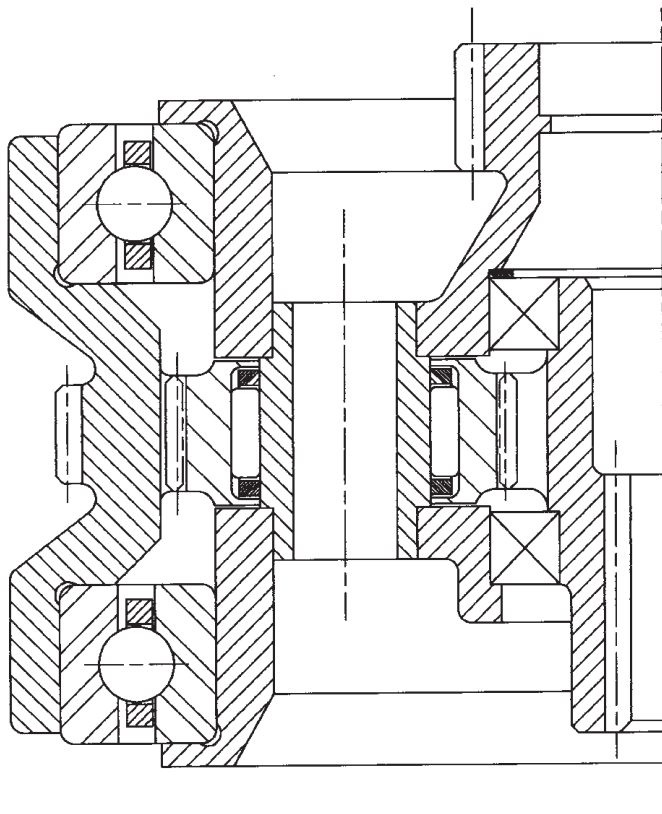
KAYDON CORPORATION	
<b>GLASS-WORKING BENCH LATHE</b>	
BEARING SHOWN:	KG070XP0 7.000" bore x 9.000" O.D. x 1.000" radial section
IMPROVED DESIGN #5	

**Pre-loaded 4-point contact Real-Slim® bearings** provide required stiffness for variable speeds and loads.



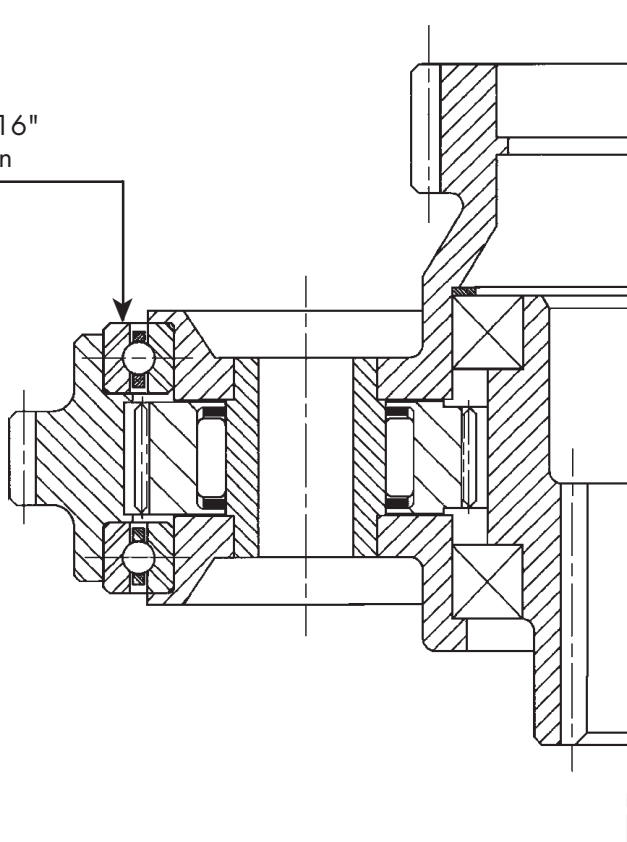
High capacity Real-Slim® bearing in a turntable-type output shaft

KAYDON CORPORATION	
<b>ZERO BACKLASH ROTARY ACTUATOR</b>	
BEARINGS USED:	Class 6 preloaded 4-pt. bearing and 2 radial bearings
MACHINERY	



◀ **Before:** This design was planned using two bearings, each 4.3307" x 5.9055" x 0.7874".

5/16" x 5/16"  
radial section



◀ **After:** Reali-Slim® bearings permitted a reduction in housing O.D. from 6.250" to 5.187", resulting in weight savings and cost reduction using standard bearings.

KAYDON CORPORATION

**AIRBORNE GEAR BOX**

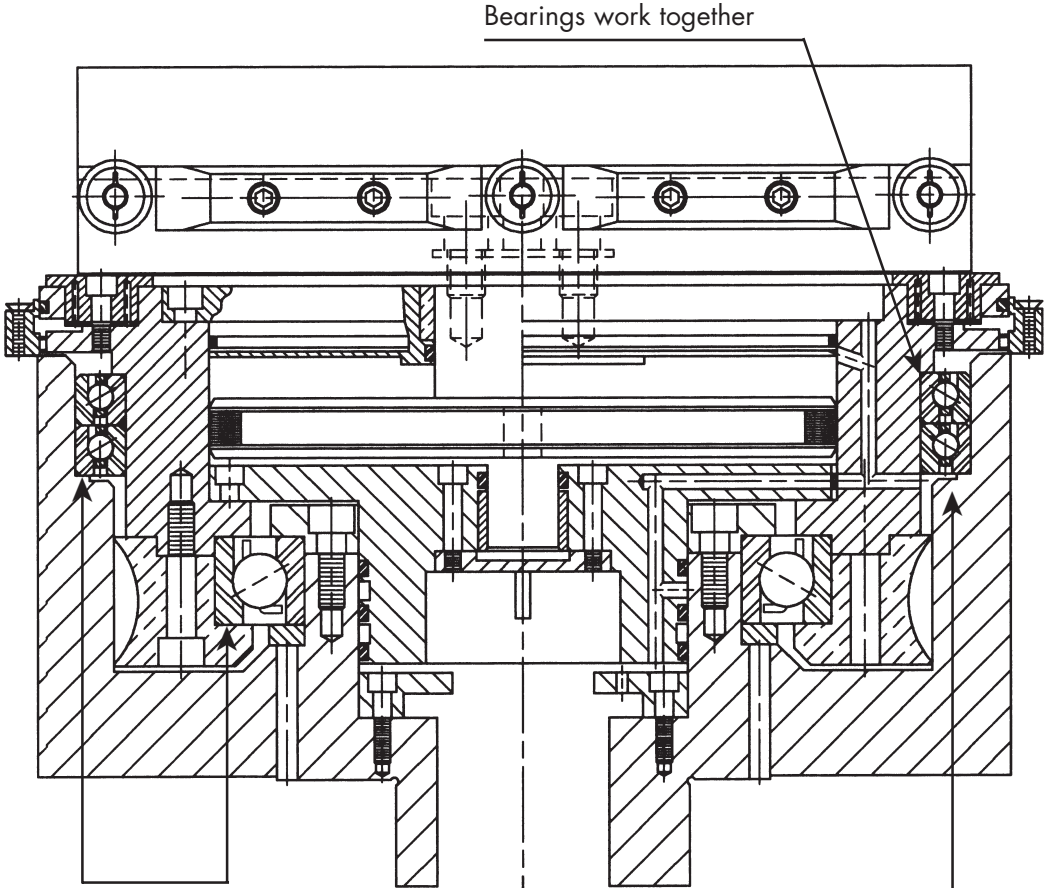
BEARING  
SHOWN:

KB042CPO 4.250" bore x 4.875" O.D.  
x .312" radial section

SCALE: FULL

IMPROVED DRAWING #6

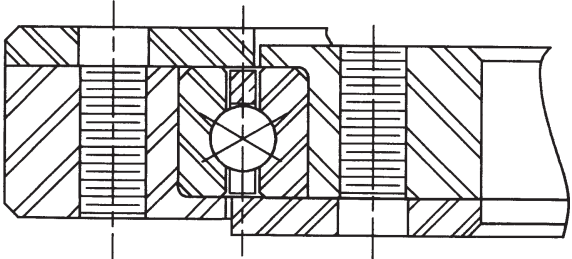
**This design improvement saves weight, space, and cost.**



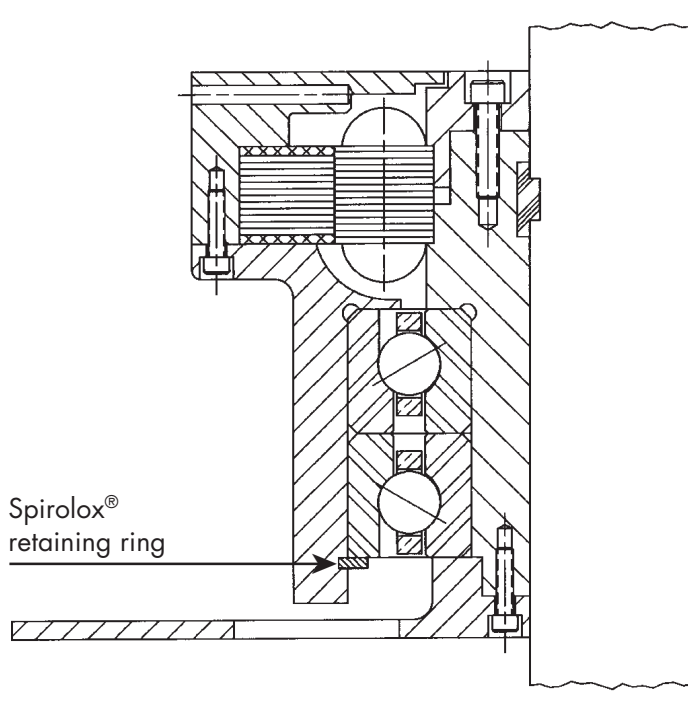
Matching bearings of two different diameters

**One bearing does the work of three** ▶

Save weight, space, and cost by replacing the three-bearing set of angular contact "Type A" bearings (shown above) with a single four-point contact "Type X" bearing. The "Type X" bearing handles thrust load, radial load, and overturning moment load simultaneously.

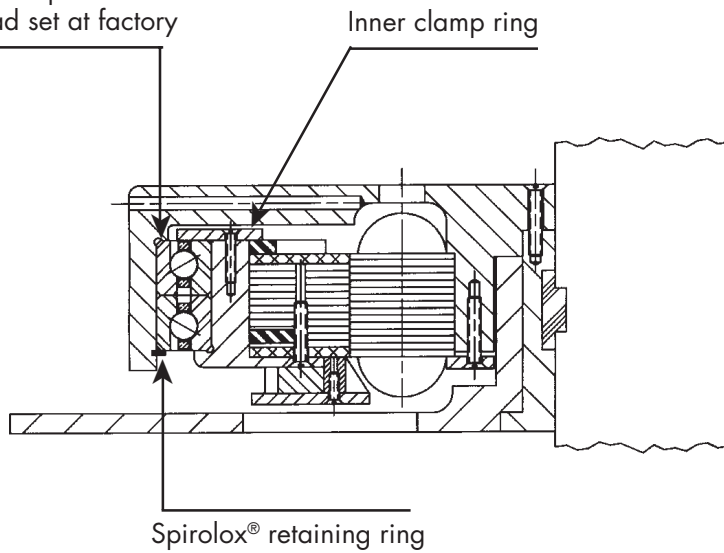


KAYDON CORPORATION	
<b>MACHINE TOOL WORK HOLDING TABLE</b>	
BEARINGS USED	KD070TRO, DUPLEXED TANDEM PAIR
MACHINE TOOLS	



◀ **Before:** Plans called for use of two of the smallest available "standard light-weight" bearings, with each bearing weighing 1.45 pounds.

Bearing No. KB065BR6K.  
Duplexed pair with  
preload set at factory



◀ **After:** Kaydon supplies two, larger-bore Reali-Slim® bearings weighing only 0.47 pounds each. This results in a much narrower, more compact, and lighter unit.

KAYDON CORPORATION

FILM WIND-UP MOTOR

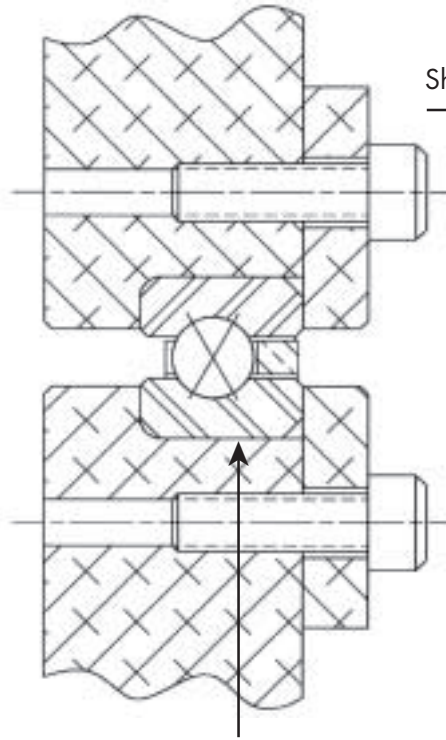
BEARING  
SHOWN:

KB065ARO 6.500" bore x 7.125 O.D.  
x .312" radial section

SCALE: FULL

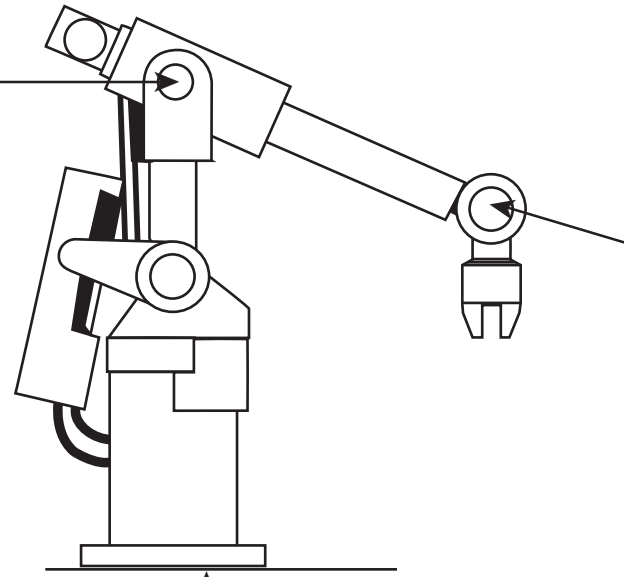
IMPROVED DESIGN #7

**For precise motion control  
in robots** and other automation  
equipment, 4-point Reali-Slim®  
bearings are ideal for multi-axis  
articulating designs.



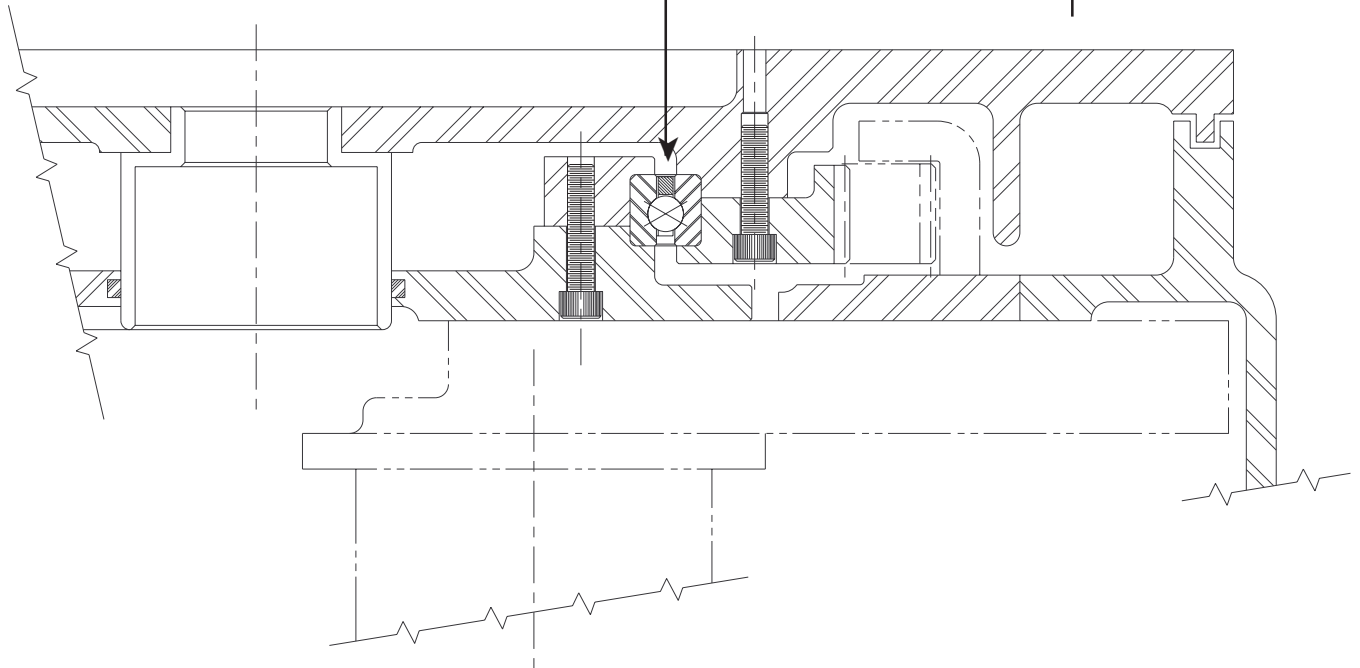
Shoulder assembly

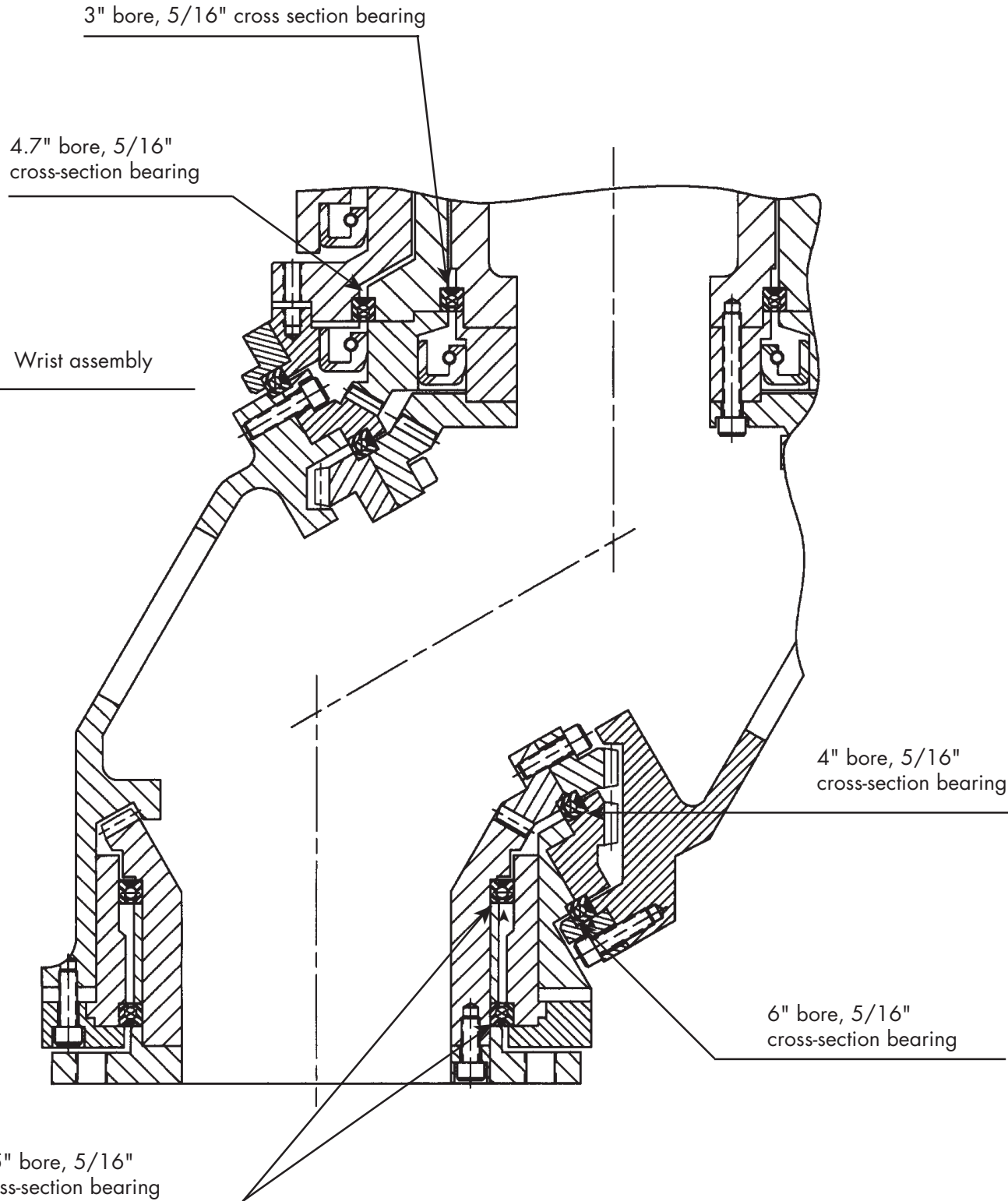
4-point Reali-Slim® bearing



4-point Reali-Slim® bearing

Waist assembly





KAYDON CORPORATION

**ROBOT WRIST ASSEMBLY**

BEARINGS  
SHOWN:

KB030XP0, KB047XP0, KB040XP0,  
KB060XP0, KB035XP0

AUTOMATION PRODUCTS

WARRANTY: Kaydon Corporation guarantees its products to be free from defects in materials and workmanship for a period of one year from date of shipment from our plant. Any product proving defective within this one-year period will be replaced free of charge provided the defective product is returned, charges prepaid, to the appropriate Kaydon facility, under Kaydon's authorization (Return Goods Authorization number issued) and found to have been properly mounted, lubricated, loaded and used. No responsibility will be assumed by Kaydon for contingent charges.

## KAYDON CORPORATION

2860 McCracken Street  
Muskegon, Michigan 49441 U.S.A.

2630 Highway 15 South  
Sumter, SC 29154 U.S.A.

3 Corporate Circle  
Sumter Industrial Complex  
Sumter, SC 29154 U.S.A.



1-800-514-3066 • Fax: 231-759-4102  
Visit our website: [kaydonbearings.com](http://kaydonbearings.com)