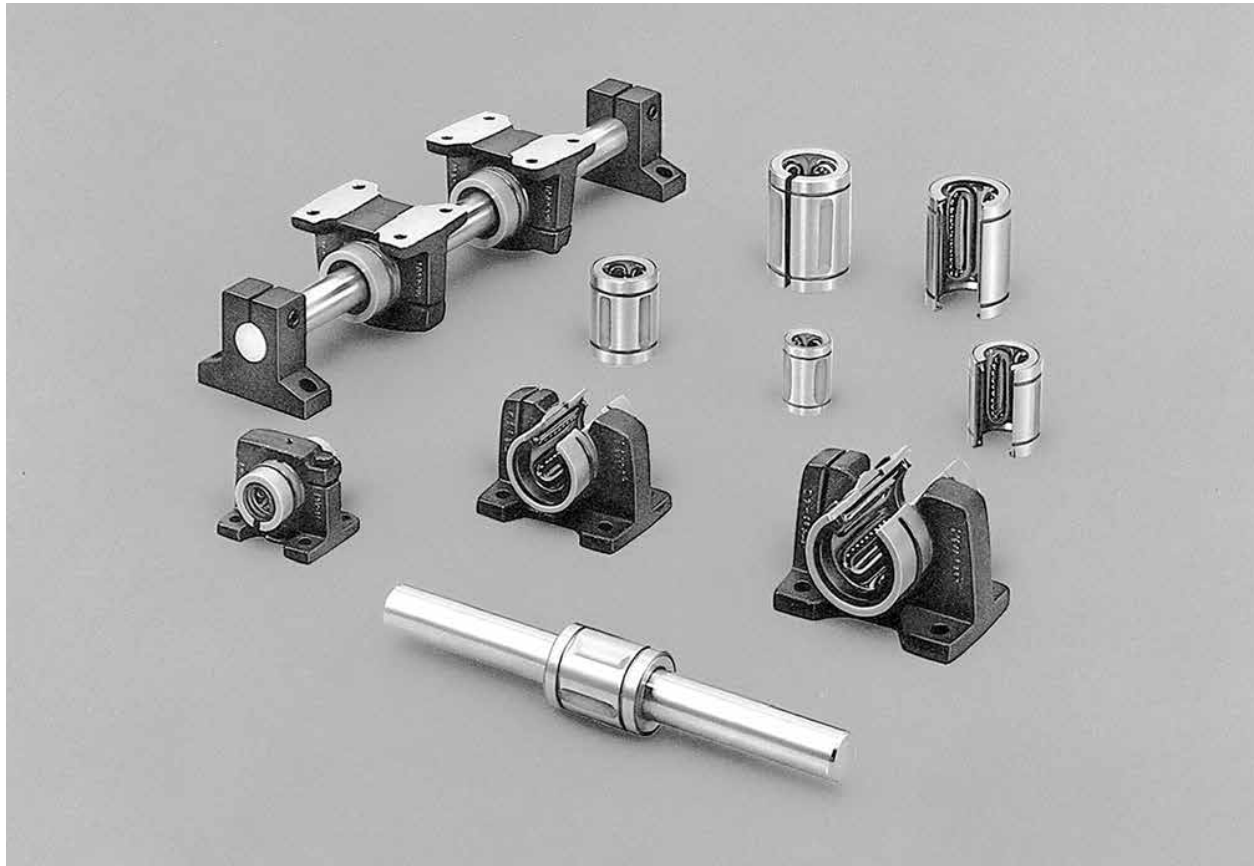


Precision Steel Ball Bushing Bearing Products



Thomson Precision Steel Ball Bushing Bearing Products offer:

- A coefficient of friction as low as .001. When replacing high-friction plain bearings, Precision Steel Ball Bushing Bearings dramatically improve machine productivity and efficiency.
- All-steel construction for maximum system rigidity.
- Two accuracy classes allowing for immediate improvements in system positioning and repeatability.
- Availability in 14 bore sizes and nine configurations.
- The RoundRail Advantage, which minimizes installation time and cost.
- Steady state travel speeds up to 10 ft./s and accelerations to 450 ft./s² without the use of derating factors.
- An operating temperature up to 600°F / 315°C.
- Availability in a self-aligning pillow block housing for ease of installation and use.

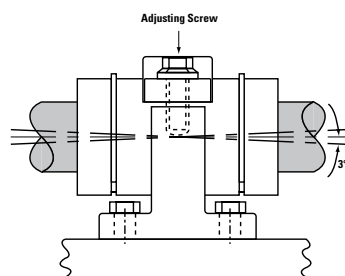


Figure 1

When the Precision Steel Ball Bushing Bearing is installed in its standard pillow block, it will self-align up to three degrees in all directions.

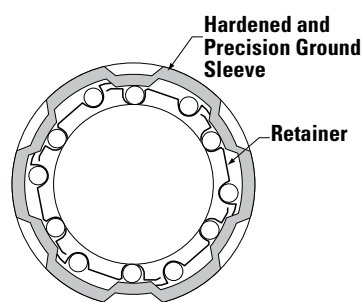


Figure 2

Precision Steel Ball Bushing Bearing cross-section

The basis for the performance of all Precision Steel Ball Bushing® Bearings is a simple but ingenious system of ball recirculation that permits almost frictionless, unlimited travel.

Replace High-Friction Plain Bearings

Plain bearings cause friction, stick-slip, binding and chatter. The Precision Steel Ball Bushing Bearing's patented ball recirculation virtually eliminates wear and provides a constant coefficient of friction as low as .001. This dramatic reduction in friction allows the designer to use smaller, less expensive drive motors, ball screws, belts, linkages and gears.

Lasting Precision Alignment

High-friction plain bearings cause wear, resulting in a loss in system alignment and repeatability. Each Precision Steel Ball Bushing Bearing is manufactured with high-quality bearing steel that is hardened and precision ground. The rolling elements of each Ball Bushing Bearing are precision, ground-bearing balls that recirculate freely into and out of the load zone. The balls are guided through their recirculation path by a steel retainer and hardened sleeve. The inherent, non-wear characteristics of each Precision Steel Ball Bushing Bearing assures maximum system accuracy and repeatability.

High Travel Speeds

Precision Steel Ball Bushing Bearings can operate at travel rates as high as 10 ft./s and accelerations as high as 450 ft./s². When replacing inefficient v-way or flat-way systems, this travel rate capability provides immediate improvements in machine efficiency and productivity.

Ease of Installation

The Precision Steel Ball Bushing Bearing can be retained in a housing, internally or externally. The retaining ring groove on the outside diameter allows the bearing to be captured and retained by an external retaining ring. If internal retention is required, the Ball Bushing Bearing can be installed in a housing and held in place with an internal retaining ring.

Protection from Contamination

Precision Steel Ball Bushing Bearings' most popular sizes are available with double-acting integral wipers that keep out contamination, retain lubrication and maximize travel life.

Part Number Description and Specification

Precision Steel Ball Bushing Bearings (Closed Type) for End Supported Applications

A162536-DDSP

Type	Description	Size	Nom. Dia.	Seals Options	Ball Options
A	Precision Steel Ball Bushing Bearings	4812	.250	Blank No Seals DD Integral Seals	Option Description
XA	Extra Precision Ball Bushing Bearings	61014	.375		SS Stainless Steel (up to and including 1")
ADJ	Adjustable Precision Steel Ball Bushing bearings	81420	.500	Blank No Seals DD Integral Seals	SP Stainless Steel Balls, Black Oxide Retainer and Sleeve
		101824	.625		NB Nylon Balls
		122026	.750		NBA Alternating Nylon Balls
		162536	1.000		Lube Options
		203242	1.250		DP Dry Pack
		243848	1.500		LL Lubricated with Thomson Linear Lube
		324864	2.000		Other Options
		406080	2.500		RP Roll Pack (no box)
		487296	3.000		
		6496128	4.000		

Precision Steel Ball Bushing Pillow Blocks (Closed Type) for End Supported Applications

PB16ADJ-SS

Type	Description	Size	Nominal Diameter	Type	Description	Ball Options
PB	Precision Steel Ball Bushing Pillow Blocks	8	.500	A Standard ADJ Adjustable Type	Option Description	SS Stainless Steel (up to and including 1")
		12	.750			SP Stainless Steel Balls, Black Oxide Retainer and Sleeve
		16	1.000			NB Nylon Balls
		20	1.250			NBA Alternating Nylon Balls
		24	1.500			Lube Options
		32	2.000			DP Dry Pack
						LL Lubricated with Thomson Linear Lube
			Other Options	HP Black Oxide, Reinforced Retainers		

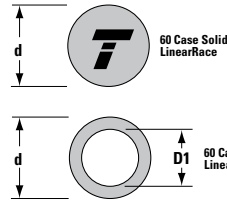
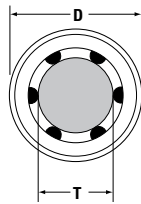
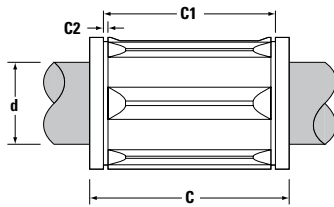
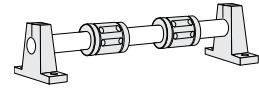
Not all options are available in all sizes.

See catalog pages or contact Thomson Customer Support for combination availability.

For additional information on bearing options, see page 264.



Precision Steel Ball Bushing® Bearings (Closed Type) for End-Supported Applications



Sizes .250 thru 1.00 available in Corrosion Resistant Stainless Steel

Precision Steel Ball Bushing Bearings (Closed Type) and 60 Case® LinearRace® (Dimensions in inches)

Part Number ⁽¹⁾		60 Case Linear Race	Nominal Diameter	Length C	Distance Between Retaining Grooves C1	Retaining Ring Groove min. C2	Number of Ball Circuits	D	60 Case Solid LinearRace Mass lb/in	60 Case Tubular Lite LinearRace Mass lb/in	60 Case Tubular Lite LinearRace ID D1
Precision Steel Ball Bushing Bearings w/o Seals	Precision Steel Ball Bushing Bearings with Seals										
A4812	–	1/4 S	.250	.750/.735	.515/.499	.039	3	.5000/.4996	.01	–	–
A61014	–	3/8 S	.375	.875/.860	.640/.624	.039	4	.6250/.6246	.03	–	–
A81420	A81420-DD	1/2 S	.500	1.250/1.235	.967/.951	.046	4	.8750/.8746	.06	–	–
A101824	–	5/8 S	.625	1.500/1.485	1.108/1.092	.056	4	1.1250/1.1246	.09	–	–
A122026	A122026-DD	3/4 S	.750	1.625/1.610	1.170/1.154	.056	5	1.2500/1.2496	.13	.08	.46/.41
A162536	A162536-DD	1 S	1.000	2.250/2.235	1.759/1.741	.068	5	1.5625/1.5621	.22	.16	.62/.56
A203242	–	1 1/4 S	1.250	2.625/2.605	2.009/1.991	.068	6	2.0000/1.9995	.35	–	–
A243848	–	1 1/2 S	1.500	3.000/2.980	2.415/2.397	.086	6	2.3750/2.3745	.50	.33	.93/.84
A324864	–	2 S	2.000	4.000/3.980	3.195/3.177	.103	6	3.0000/2.9994	.89	.54	1.31/1.18
A406080	–	2 1/2 S	2.500	5.000/4.975	3.978/3.958	.120	6	3.7500/3.7492	1.39	.75	1.84/1.66
A487296	–	3 S	3.000	6.000/5.970	4.728/4.708	.120	6	4.5000/4.4990	2.00	1.11	2.20/1.80
A6496128	–	4 S	4.000	8.000/7.960	6.265/6.235	.139	6	6.0000/5.9988	3.56	1.56	3.30/2.70

Part Number ⁽¹⁾		Working Bore Diameter T	Recommended Housing Bore		60 Case LinearRace Diameter d	Precision Steel Ball Bushing Bearing/LinearRace Fit Up ‡	Precision Steel Ball Bushing Bearing Mass lb	Dynamic ⁽²⁾ Load Capacity lb _r
Precision Steel Ball Bushing Bearings w/o Seals	Precision Steel Ball Bushing Bearings with Seals		Normal Fit	Press Fit				
A4812	–	.2500/.2495	.5005/.5000	.4995/.4990	.2490/.2485	.0015C/.0005C	.02	19
A61014	–	.3750/.3745	.6255/.6250	.6245/.6240	.3740/.3735	.0015C/.0005C	.06	37
A81420	A81420-DD	.5000/.4995	.8755/.8750	.8745/.8740	.4990/.4985	.0015C/.0005C	.08	85
A101824	–	.6250/.6245	1.1255/1.1250	1.1245/1.1240	.6240/.6235	.0015C/.0005C	.16	150
A122026	A122026-DD	.7500/.7495	1.2505/1.2500	1.2495/1.2490	.7490/.7485	.0015C/.0005C	.21	200
A162536	A162536-DD	1.0000/.9995	1.5630/1.5625	1.5620/1.5615	.9990/.9985	.0015C/.0005C	.38	350
A203242	–	1.2500/1.2494	2.0010/2.0000	1.9993/1.9983	1.2490/1.2485	.0015C/.0004C	1.10	520
A243848	–	1.5000/1.4994	2.3760/2.3750	2.3743/2.3733	1.4989/1.4984	.0016C/.0005C	1.43	770
A324864	–	2.0000/1.9992	3.0010/3.0000	2.9992/2.9982	1.9987/1.9980	.0020C/.0005C	2.75	1100
A406080	–	2.5000/2.4990	3.7510/3.7500	Not Normally Recommended	2.4985/2.4977	.0023C/.0005C	5.50	1800
A487296	–	3.0000/2.9988	4.5010/4.5000		2.9983/2.9974	.0026C/.0005C	9.50	2600
A6496128	–	4.0000/3.9980	6.0010/6.0000		3.9976/3.9964	.0036C/.0004C	20.20	5000

‡ P = Preload, C = Clearance

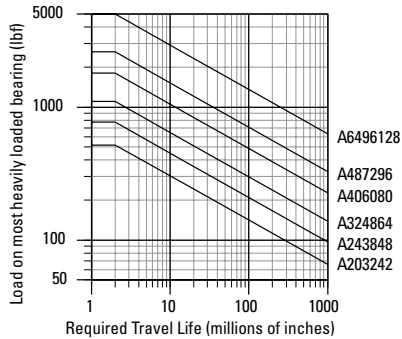
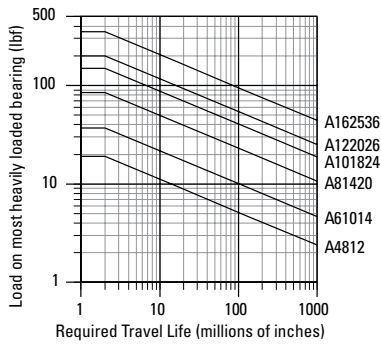
(1) For part number description and specifications, see page 71.

(2) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs.

Thomson RoundRail Linear Guides and Components

Load/Life Graph

(Lines indicate limiting load for given Ball Bushing Bearing)



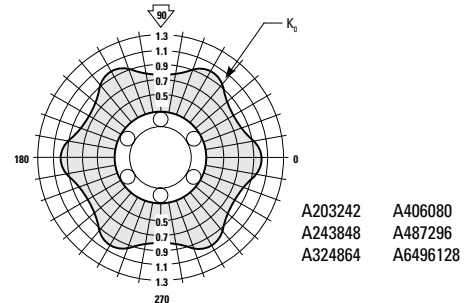
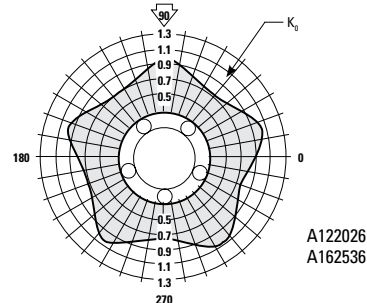
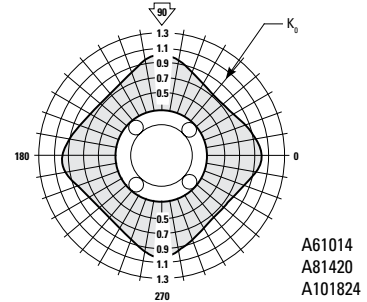
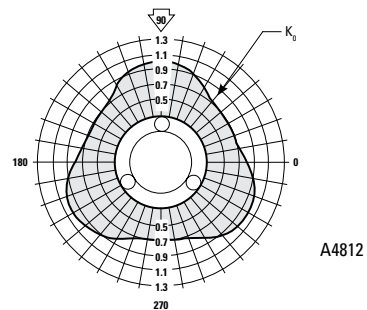
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing, size enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

Polar Graphs

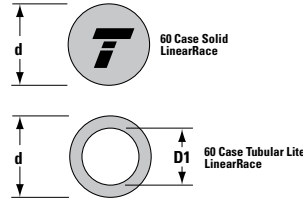
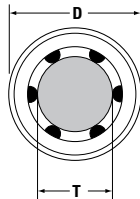
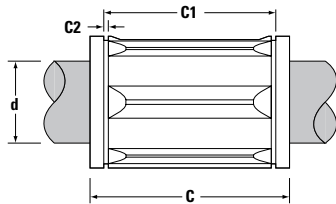
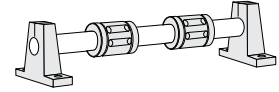
The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.



Inch Ball Bushing Bearings



Extra Precision Steel Ball Bushing® Bearings (Closed Type) for End-Supported Applications



Sizes .250 thru 1.00 available in Corrosion Resistant Stainless Steel

Extra Precision Steel Ball Bushing Bearings (Closed Type) and 60 Case® LinearRace® (Dimensions in inches)

Part Number ⁽¹⁾		60 Case Linear Race	Nominal Diameter	Length C	Distance Between Retaining Grooves C1	Retaining Ring Groove min. C2	Number of Ball Circuits	D	60 Case Solid LinearRace Mass lb/in	60 Case Tubular Lite LinearRace Mass lb/in	60 Case Tubular Lite LinearRace ID D1
Extra Precision Steel Ball Bushing Bearing	w/o Wipers										
XA4812	-	1/4 L	.250	.750/.735	.515/.499	.039	3	.5000/.4996	.01	-	-
XA61014	-	3/8 L	.375	.875/.860	.640/.624	.039	4	.6250/.6246	.03	-	-
XA81420	XA81420-DD	1/2 L	.500	1.250/1.235	.967/.951	.046	4	.8750/.8746	.06	-	-
XA101824	-	5/8 L	.625	1.500/1.485	1.108/1.092	.056	4	1.1250/1.1246	.09	-	-
XA122026	XA122026-DD	3/4 L	.750	1.625/1.610	1.170/1.154	.056	5	1.2500/1.2496	.13	.08	.46/.41
XA162536	XA162536-DD	1 L	1.000	2.250/2.235	1.759/1.741	.068	5	1.5625/1.5621	.22	.16	.62/.56
XA203242	-	1 1/4 L	1.250	2.625/2.605	2.009/1.991	.068	6	2.0000/1.9995	.35	-	-
XA243848	-	1 1/2 L	1.500	3.000/2.980	2.415/2.397	.086	6	2.3750/2.3745	.50	.33	.93/.84
XA324864	-	2 L	2.000	4.000/3.980	3.195/3.177	.103	6	3.0000/2.9994	.89	.54	1.31/1.18
XA406080	-	2 1/2 L	2.500	5.000/4.975	3.978/3.958	.120	6	3.7500/3.7492	1.39	.75	1.84/1.66
XA487296	-	3 L	3.000	6.000/5.970	4.728/4.708	.120	6	4.5000/4.4990	2.00	1.11	2.20/1.80
XA6496128	-	4 L	4.000	8.000/7.960	6.265/6.235	.139	6	6.0000/5.9988	3.56	1.56	3.30/2.70

Part Number ⁽¹⁾		Working Bore Diameter T	Recommended Housing Bore		60 Case LinearRace Diameter d	Precision Steel Ball Bushing Bearing/ LinearRace Fit Up ‡	Precision Steel Ball Bushing Bearing Mass lb	Dynamic ⁽²⁾ Load Capacity lb _f
w/o Seals	with Seals		Normal Fit	Press Fit				
XA4812	-	.2500/.2497	.5005/.5000	Not Normally Recommended	.2495/.2490	.0010C/.0002C	.02	19
XA61014	-	.3750/.3747	.6255/.6250		.3745/.3740	.0010C/.0002C	.06	37
XA81420	XA81420-DD	.5000/.4997	.8755/.8750		.4995/.4990	.0010C/.0002C	.08	85
XA101824	-	.6250/.6247	1.1255/1.1250		.6245/.6240	.0010C/.0002C	.16	150
XA122026	XA122026-DD	.7500/.7497	1.2505/1.2500		.7495/.7490	.0010C/.0002C	.21	200
XA162536	XA162536-DD	1.0000/.9997	1.5630/1.5625		.9995/.9990	.0010C/.0002C	.38	350
XA203242	-	1.2500/1.2496	2.0010/2.0000		1.2495/1.2490	.0010C/.0001C	1.10	520
XA243848	-	1.5000/1.4996	2.3760/2.3750		1.4994/1.4989	.0011C/.0002C	1.43	770
XA324864	-	2.0000/1.9996	3.0010/3.0000		1.9994/1.9987	.0013C/.0002C	2.75	1100
XA406080	-	2.5000/2.4995	3.7510/3.7500		2.4993/2.4985	.0015C/.0002C	5.50	1800
XA487296	-	3.0000/2.9994	4.5010/4.5000		2.9992/2.9983	.0017C/.0002C	9.50	2600
XA6496128	-	4.0000/3.9990	6.0010/6.0000		3.9988/3.9976	.0024C/.0002C	20.20	5000

‡ P = Preload, C = Clearance

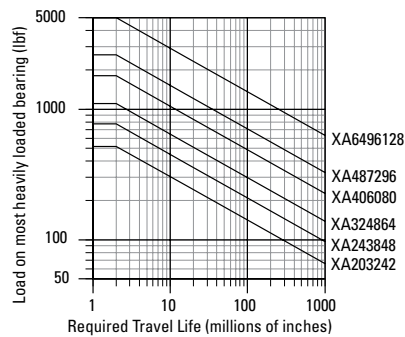
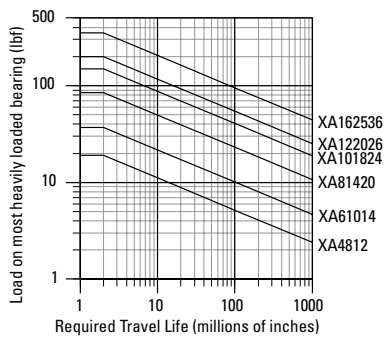
(1) For part number description and specifications see page 71.

(2) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs.

Thomson RoundRail Linear Guides and Components

Load/Life Graph

(Lines indicate limiting load for given Ball Bushing Bearing)



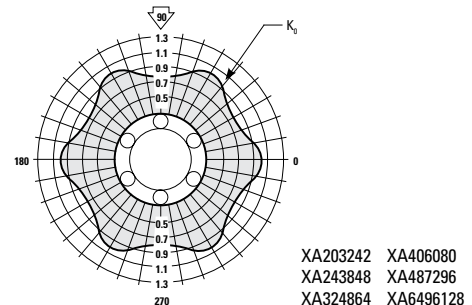
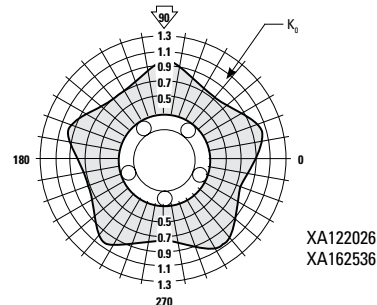
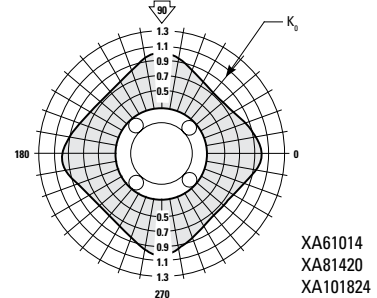
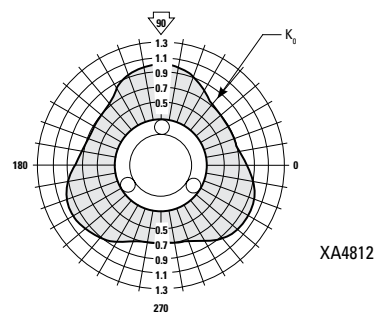
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing size, enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

Polar Graphs

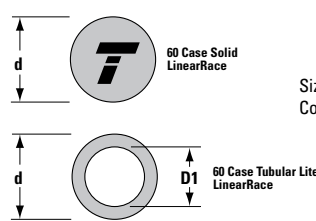
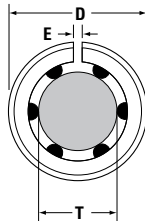
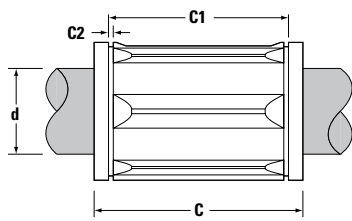
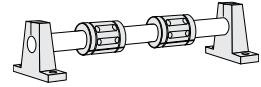
The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.



Inch Ball Bushing Bearings



Adjustable Precision Steel Ball Bushing® Bearings (Closed Type) for End-Supported Applications



Sizes .250 thru 1.00 available in Corrosion Resistant Stainless Steel

Adjustable Precision Steel Ball Bushing Bearings and 60 Case® LinearRace® (Dimensions in inches)

Part Number ⁽¹⁾		Nominal Diameter	Length C	Distance Between Retaining Grooves C1	Retaining Ring Groove min. C2	Min. Slot Width E	Number of Ball Circuits	60 Case LinearRace Minimum Depth of Hardness	60 Case Solid LinearRace Mass lb/in	60 Case Tubular Lite LinearRace Mass lb/in	60 Case Tubular Lite LinearRace ID D1
Precision Steel Ball Bushing Bearing	60 Case Linear Race										
ADJ81420	1/2 L	.500	1.250/1.235	.967/.951	.046	.06	4	.04	.06	—	—
ADJ101824	5/8 L	.625	1.500/1.485	1.108/1.092	.056	.09	4	.04	.09	—	—
ADJ122026	3/4 L	.750	1.625/1.610	1.170/1.154	.056	.09	5	.06	.13	.08	.46/.41
ADJ162536	1 L	1.000	2.250/2.235	1.759/1.741	.068	.09	5	.08	.22	.16	.62/.56
ADJ203242	1 1/4 L	1.250	2.625/2.605	2.009/1.991	.068	.09	6	.08	.35	—	—
ADJ243848	1 1/2 L	1.500	3.000/2.980	2.415/2.397	.086	.13	6	.08	.50	.33	.93/.84
ADJ324864	2 L	2.000	4.000/3.980	3.195/3.177	.103	.13	6	.10	.89	.54	1.31/1.18
ADJ406080	2 1/2 L	2.500	5.000/4.975	3.978/3.958	.120	.13	6	.10	1.39	.75	1.84/1.66
ADJ487296	3 L	3.000	6.000/5.970	4.728/4.708	.120	.13	6	.10	2.00	1.11	2.20/1.80
ADJ6496128	4 L	4.000	8.000/7.960	6.265/6.235	.139	.13	6	.10	3.56	1.56	3.30/2.70

Part Number ⁽¹⁾	Working Bore Diameter T	Recommended Housing Bore Diameter D	60 Case LinearRace Diameter d	Precision Steel Ball Bushing Bearing Mass lb	Dynamic ⁽²⁾ Load Capacity lb _f
		Normal Fit			
ADJ81420	.5000/.4995	.8755/.8750	.4995/.4990	.08	85
ADJ101824	.6250/.6245	1.1255/1.1250	.6245/.6240	.16	150
ADJ122026	.7500/.7495	1.2505/1.2500	.7495/.7490	.21	200
ADJ162536	1.0000/.9995	1.5630/1.5625	.9995/.9990	.38	350
ADJ203242	1.2500/1.2494	2.0010/2.0000	1.2495/1.2490	1.10	520
ADJ243848	1.5000/1.4994	2.3760/2.3750	1.4994/1.4989	1.43	770
ADJ324864	2.0000/1.9992	3.0010/3.0000	1.9994/1.9987	2.75	1100
ADJ406080	2.5000/2.4990	3.7510/3.7500	2.4993/2.4985	5.50	1800
ADJ487296	3.0000/2.9988	4.5010/4.5000	2.9992/2.9983	9.50	2600
ADJ6496128	4.0000/3.9980	6.0010/6.0000	3.9988/3.9976	20.20	5000

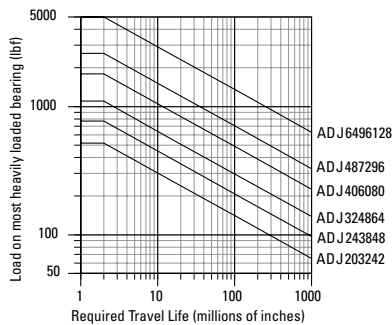
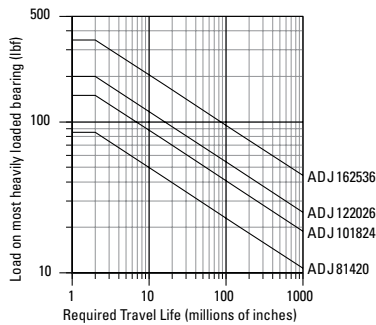
(1) For part number description and specifications see page 71.

(2) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs.

Thomson RoundRail Linear Guides and Components

Load/Life Graph

(Lines indicate limiting load for given Ball Bushing Bearing)



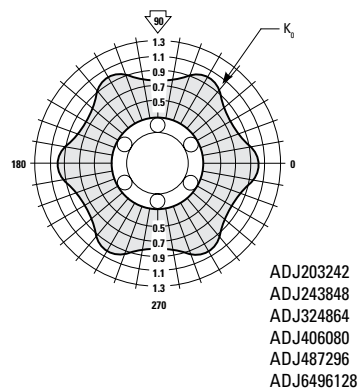
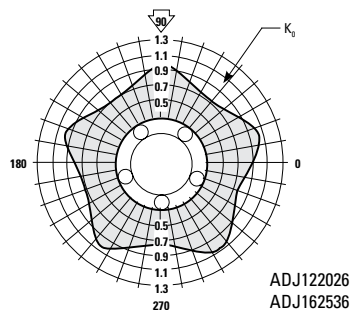
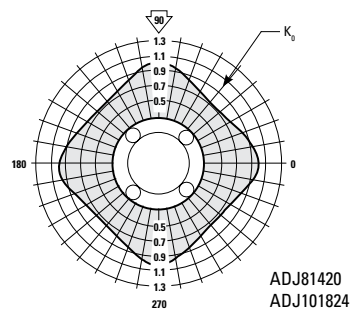
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing size, enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

Polar Graphs

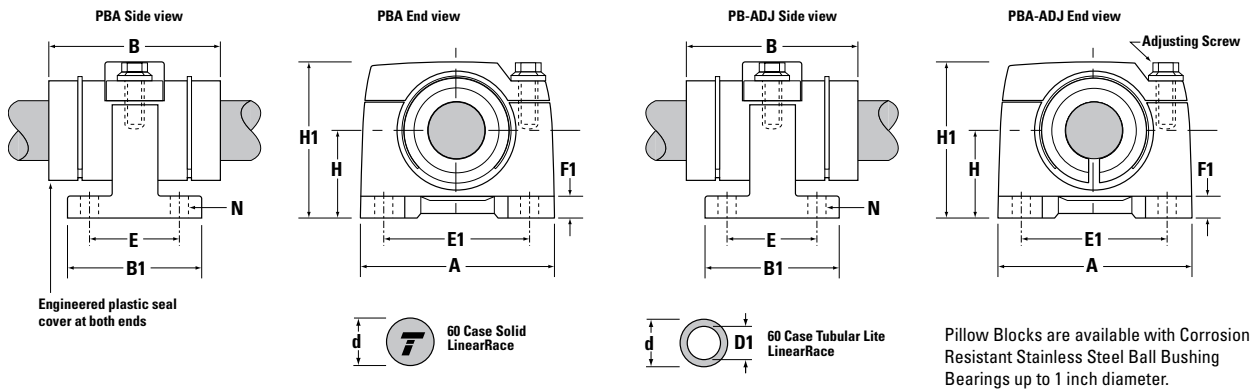
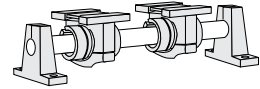
The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.



Inch Ball Bushing Bearings



Precision Steel Ball Bushing® Pillow Blocks (Closed and Adjustable Type) for End-Supported Applications



Precision Steel Ball Bushing Pillow Blocks (Closed and Adjustable Type) and 60 Case® LinearRace® (Dimensions in inches)

Part Number ⁽¹⁾				Nom. Dia.	H ±.005	H1	Class S 60 Case LinearRace Diameter d	Class L 60 Case LinearRace Diameter d	60 Case LinearRace Minimum Depth of Hardness	60 Case Solid LinearRace Mass lb/in	60 Case Tubular Lite LinearRace Mass lb/in	60 Case Tubular Lite LinearRace ID D1
Precision Steel Ball Bushing Pillow Block	60 Case LinearRace Class S	Precision Steel Ball Bushing Pillow Block	60 Case LinearRace Class L									
Closed		Adjustable										
PB8A	1/2 S	PB8ADJ	1/2 L	.500	.875	1.63	.4990/.4985	.4995/.4990	.04	.06	—	—
PB12A	3/4 S	PB12ADJ	3/4 L	.750	1.125	2.13	.7490/.7485	.7495/.7490	.06	.13	.08	.46/.41
PB16A	1 S	PB16ADJ	1 L	1.000	1.375	2.56	.9990/.9985	.9995/.9990	.08	.22	.16	.62/.56
PB20A	1 1/4 S	PB20ADJ	1 1/4 L	1.250	1.750	3.25	1.2490/1.2485	1.2495/1.2490	.08	.35	—	—
PB24A	1 1/2 S	PB24ADJ	1 1/2 L	1.500	2.000	3.75	1.4989/1.4984	1.4994/1.4989	.08	.50	.33	.93/.84
PB32A	2 S	PB32ADJ	2 L	2.000	2.500	4.75	1.9987/1.9980	1.9994/1.9987	.10	.89	.54	1.31/1.18

Part Number ⁽¹⁾		A	B	B1	E ±.010	E1 ±.010	F1	N		Pillow Block Mass lb	Dynamic ⁽²⁾ Load Capacity lb _f
Precision Steel Ball Bushing Pillow Block								Hole	Bolt		
Closed	Adjustable										
PB8A	PB8ADJ	2.00	1.69	1.50	1.000	1.500	.25	.19	#8	.5	85
PB12A	PB12ADJ	2.75	2.06	2.00	1.375	2.000	.31	.22	#10	1.3	200
PB16A	PB16ADJ	3.25	2.88	2.25	1.500	2.500	.38	.28	1/4	2.1	350
PB20A	PB20ADJ	4.00	3.63	2.75	1.875	3.000	.44	.34	5/16	4.4	520
PB24A	PB24ADJ	4.75	4.00	3.00	2.000	3.500	.50	.34	5/16	5.7	770
PB32A	PB32ADJ	6.00	5.00	3.50	2.500	4.500	.63	.41	3/8	10.5	1100

(1) For part number description and specifications see page 71.

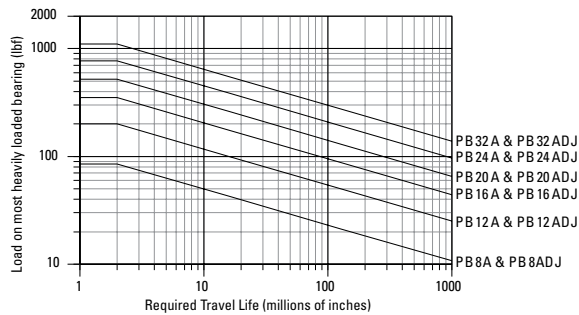
(2) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs.

Note: Check bearing clearance when using Thomson end supports.

Thomson RoundRail Linear Guides and Components

Load/Life Graph

(Lines indicate limiting load for given Ball Bushing Bearing)



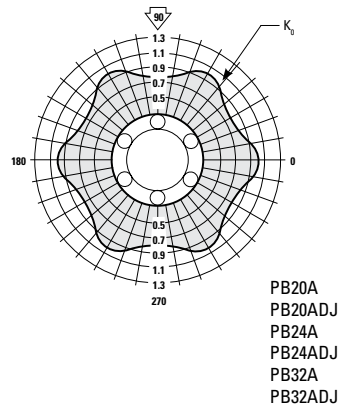
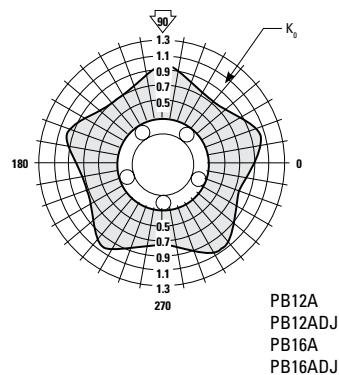
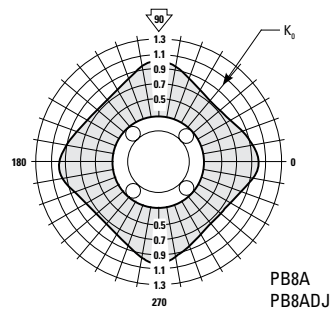
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing size, enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

Polar Graphs

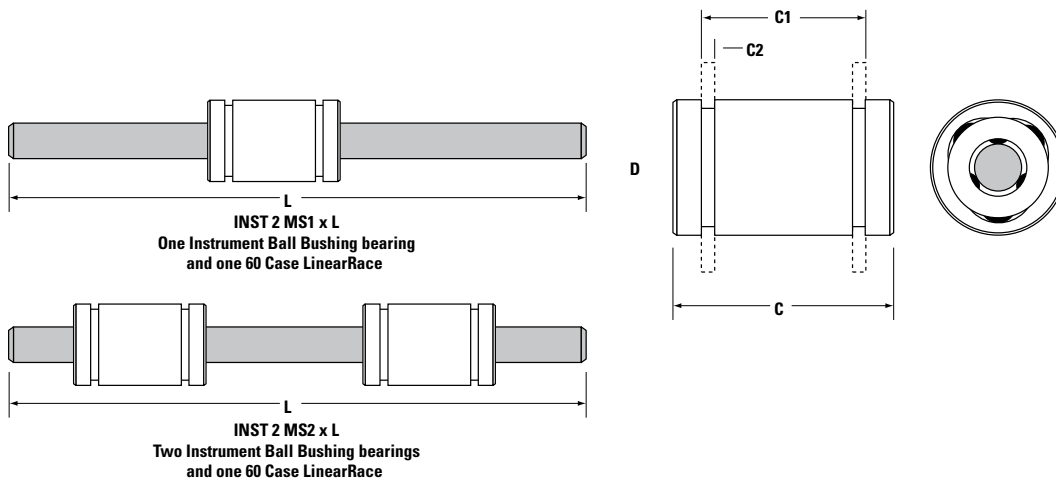
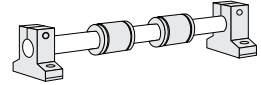
The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.



Inch Ball Bushing Bearings



Miniature Instrument Ball Bushing® Bearing and 60 Case® LinearRace® Sets



Miniature Instrument Ball Bushing Bearings and 60 Case LinearRace Sets (Dimensions in inches)

Part Number		Nominal Diameter	Outside Diameter D	Ball Bushing Bearing Length C	Distance Between Retaining Rings C1	Retaining Ring Groove min. C2	Recommended ‡ Housing Bore	Number of Ball Circuits	Ball Bushing Bearing Mass lb/in	60 Case LinearRace Mass lb/in
One Bearing	Two Bearings									
INST2MS1	INST2MS2	.1250	.3125/.3121	.500/.485	.354	.028	.3130/.3124	3	.007	.004
INST3MS1	INST3MS2	.1875	.3750/.3746	.562/.547	.417	.028	.3755/.3749	3	.011	.008
INST4MS1	INST4MS2	.2500	.5000/.4996	.750/.735	.499	.039	.5005/.4999	3	.025	.014

Miniature Instrument Ball Bushing Bearings (Dimensions in inches)

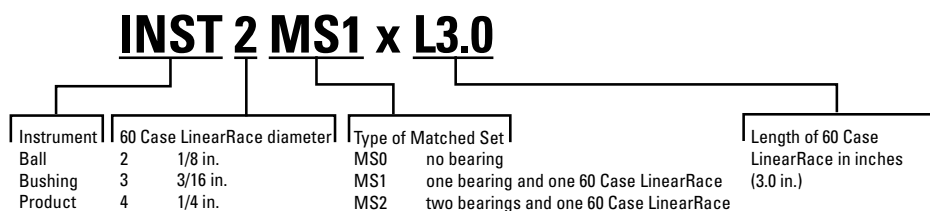
Part Number	Working Bore Diameter	LinearRace Maximum Length	60 Case LinearRace Diameter d	Instrument Ball Bushing Bearing/LinearRace Set Fit Up	Dynamic ⁽¹⁾ Load Capacity lb _f
INST258SS	.1250/.1247	12	.1248/.1247	.0003C/.0001C	7
INST369SS	.1875/.1872	12	.1873/.1872	.0003C/.0001C	9
INST4812SS	.2500/.2497	12	.2498/.2497	.0003C/.0001C	19

‡ Press fit not recommended.

(1) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs. Dynamic load capacity for MS2 configuration is based on two bearings equally loaded.

Note: For additional technical information, see the Engineering section beginning on page 252.

Part Number Description

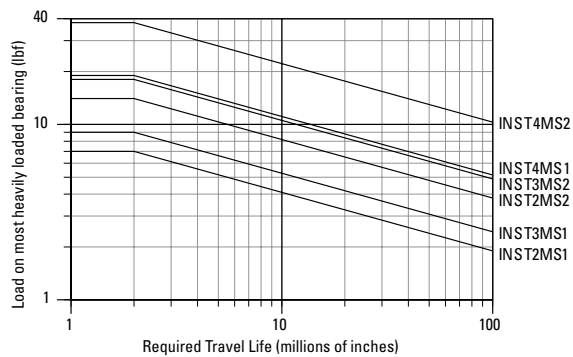


60 Case LinearRace Specifications
 Material: 440 Stainless Steel
 Hardness: 55 HRC minimum
 Surface Finish: 4 R_a microinch
 Straightness: .0001 inch per inch

Thomson RoundRail Linear Guides and Components

Load/Life Graph

(Lines indicate limiting load for given Ball Bushing Bearing)



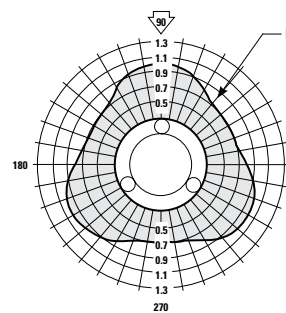
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing size, enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

Polar Graphs

The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.

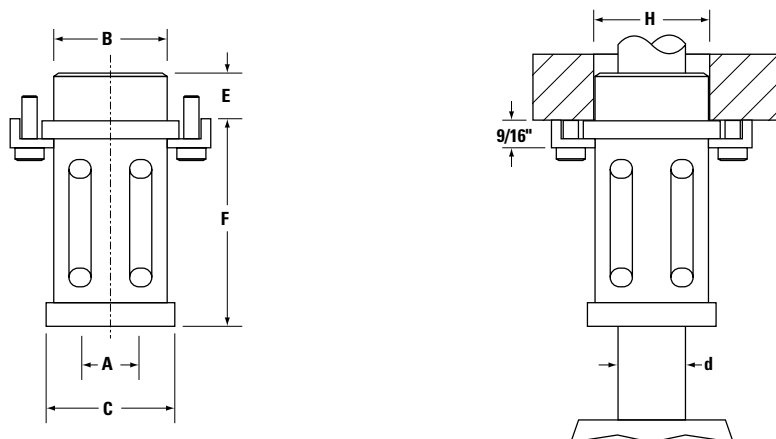
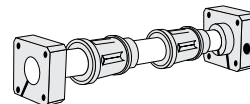


INST258SS
INST369SS
INST4812SS

Inch Ball Bushing Bearings



Die Set Ball Bushing® Bearings for End-Supported Applications



Precision Series Die Set Ball Bushing Bearings and 60 Case® LinearRace® (Dimensions in inches)

Part Number		Nominal Diameter	60 Case LinearRace Diameter d	Working Bore Diameter A	Ball Bushing Pilot Diameter B	O.D. C	Ball Bushing Bearing Pilot Length E	F	Bearing Weight lb	Recommended Mounting Hole Diameter H	Concentricity of Pilot (B) to Bearing Bore (A) (TIR)	Dynamic Load Capacity lb _i ⁽¹⁾
DS Ball Bushing Bearing	60 Case Linear Race											
DS16	1 D	1.000	1.0003/1.0000	.9999/.9996	1.5007/1.5003	1.91	.94	3.17	1.350	1.5005/1.5000	.0007	350
DS20	1 1/4 D	1.250	1.2503/1.2500	1.2498/1.2495	1.7507/1.7503	2.31	1.19	3.67	2.145	1.7505/1.7500	.0007	520
DS24	1 1/2 D	1.500	1.5003/1.5000	1.4997/1.4994	2.0007/2.0003	2.72	1.44	4.17	3.255	2.0005/2.0000	.0007	770
DS32	2 D	2.000	2.0003/2.0000	1.9995/1.9992	2.5007/2.5003	3.53	1.94	4.42	5.640	2.5005/2.5000	.0007	1100

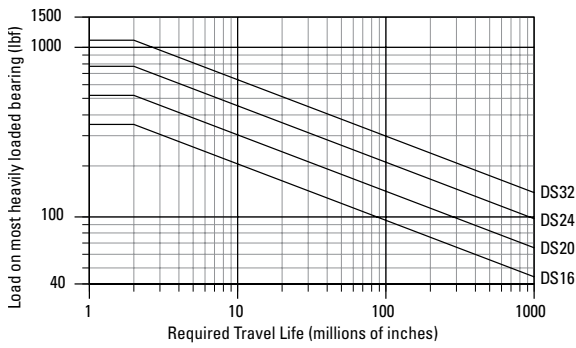
(1) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs.

Note: For additional technical information, see the Engineering section beginning on page 252.

Thomson RoundRail Linear Guides and Components

Load/Life Graph

(Lines indicate limiting load for given Ball Bushing Bearing)



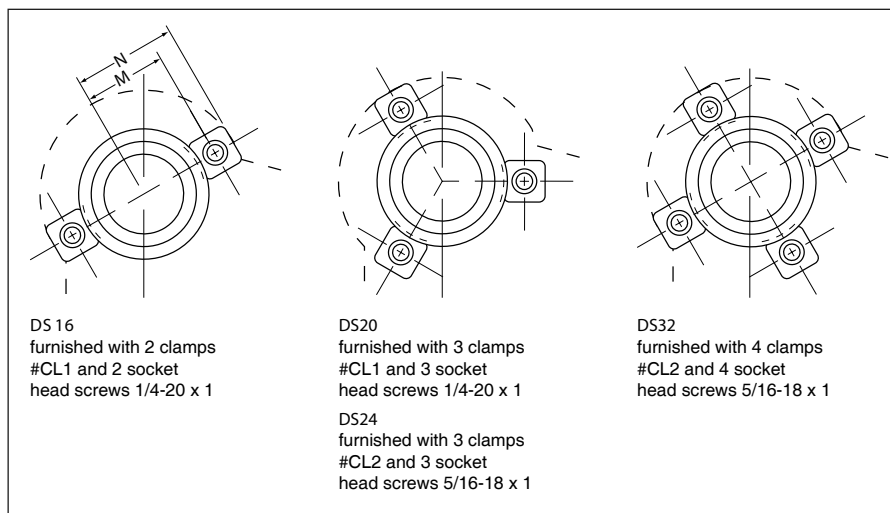
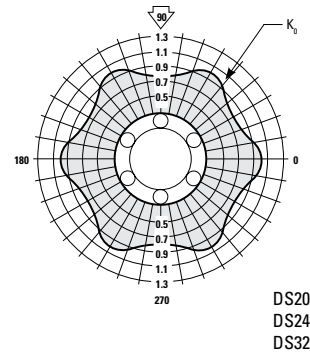
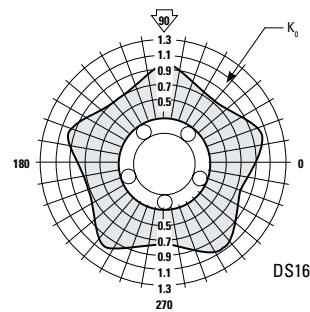
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing size, enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

Polar Graphs

The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.



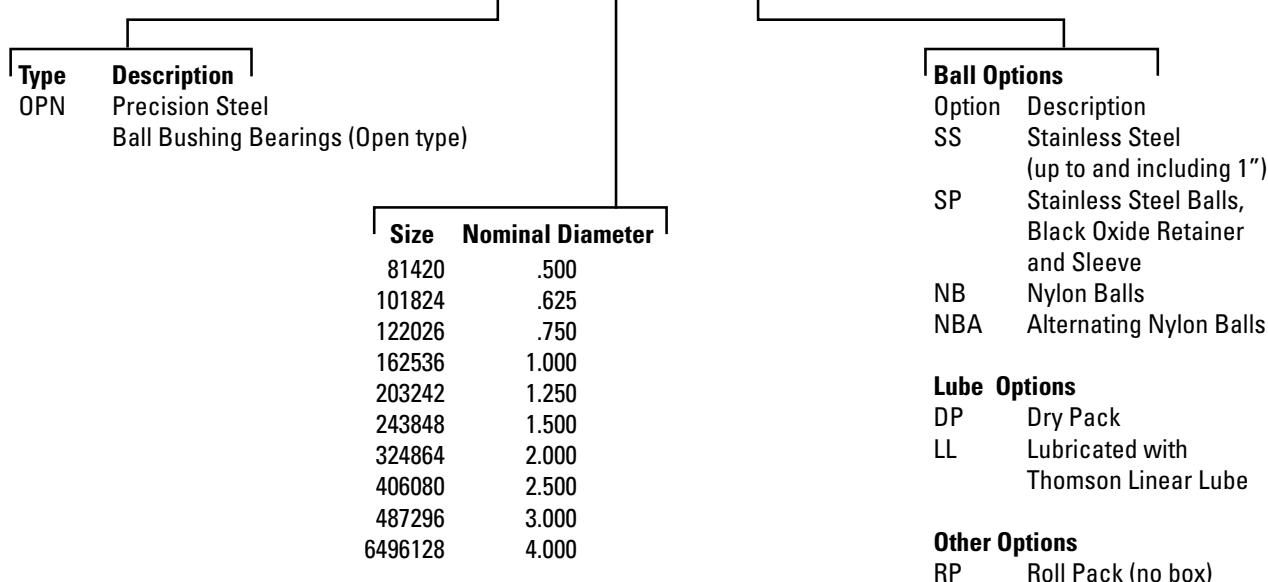
Die Set DS (Dimensions in Inches)			
Part Number		M	N
DS Ball Bushing Bearing	DS-B Ball Bushing Bearing		
DS16	DS16B	1.06	1.41
DS20	DS20B	1.27	1.61
DS24	DS24B	1.56	2.00
DS32	DS32B	1.94	2.38



Part Number Description and Specification

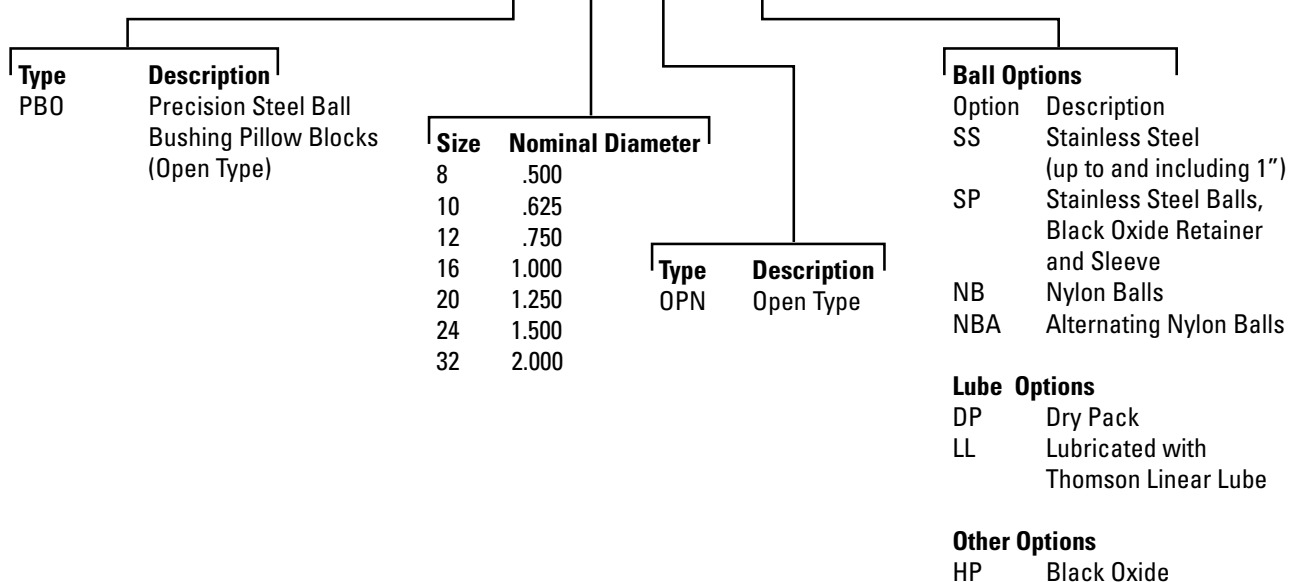
Precision Steel Ball Bushing® Bearings (Open Type) for Continuously Supported Applications

OPN162536-SS



Precision Steel Ball Bushing Pillow Blocks (Open Type) for Continuously Supported Applications

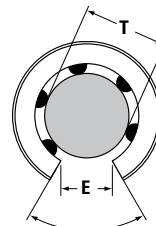
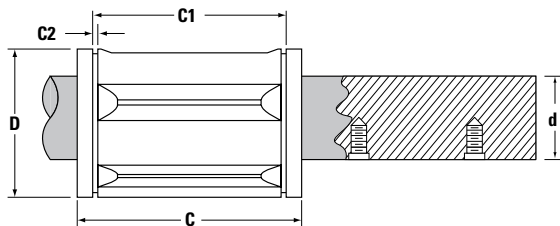
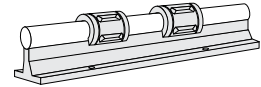
PB080PN-SS



Not all options are available in all sizes.
 See catalog pages or contact Thomson Customer Support for combination availability.
 For additional information on bearing options, see page 264.

Thomson RoundRail Linear Guides and Components

Precision Steel Ball Bushing Bearings (Open Type) for Continuously Supported Applications



Sizes .500 thru 1.00 available in Corrosion resistant Stainless Steel.

Inch Ball Bushing Bearings

Precision Steel Ball Bushing Bearings (Open Type) and 60 Case® LinearRace® (Dimensions in inches)

Part Number ⁽¹⁾		Nominal Diameter	Length C	Distance Between Retaining Rings C1	Ret. Ring Groove min. C2
Precision Steel Ball Bushing Bearing	60 Case LinearRace*				
OPN81420	1/2 L PD	.500	1.250/1.235	.967/.951	.046
OPN101824	5/8 L PD	.625	1.500/1.485	1.108/1.092	.056
OPN122026	3/4 L PD	.750	1.625/1.610	1.170/1.154	.056
OPN162536	1 L PD	1.000	2.250/2.235	1.759/1.741	.068
OPN203242	1 1/4 L PD	1.250	2.625/2.605	2.009/1.991	.068
OPN243848	1 1/2 L PD	1.500	3.000/2.980	2.415/2.397	.086
OPN324864	2 L PD	2.000	4.000/3.980	3.195/3.177	.103
OPN406080	2 1/2 L	2.500	5.000/4.975	3.978/3.958	.120
OPN487296	3 L	3.000	6.000/5.970	4.728/4.708	.120
OPN6496128	4 L	4.000	8.000/7.960	6.265/6.235	.139

* 60 Case begins on page 174.

Part Number ⁽¹⁾	Working Bore Diameter T	Recommended Housing Bore Before Adjustment D	60 Case LinearRace Diameter d	Minimum Slot Width E	Angle deg α	Number of Ball Circuits	Ball Bushing Bearing Mass lb	Dynamic ⁽²⁾ Load Capacity lb _i
OPN81420	.5005/.4995	.8760/.8740	.4995/.4990	.31	50	3	.07	60
OPN101824	.6255/.6245	1.1260/1.1240	.6245/.6240	.38	60	3	.11	105
OPN122026	.7505/.7495	1.2510/1.2490	.7495/.7490	.44	60	4	.17	140
OPN162536	1.0005/.9995	1.5635/1.5615	.9995/.9990	.56	60	4	.32	240
OPN203242	1.2506/1.2494	2.0010/1.9990	1.2495/1.2490	.63	50	5	.90	400
OPN243848	1.5006/1.4994	2.3760/2.3740	1.4994/1.4989	.75	50	5	1.12	600
OPN324864	2.0008/1.9992	3.0010/2.9990	1.9994/1.9987	1.00	50	5	2.16	860
OPN406080	2.5010/2.4990	3.7515/3.7485	2.4993/2.4985	1.25	50	5	4.24	1380
OPN487296	3.0012/2.9988	4.5015/4.4985	2.9992/2.9983	1.50	50	5	7.33	2000
OPN6496128	4.0020/3.9980	6.0020/5.9980	3.9988/3.9976	2.00	50	5	17.25	3800

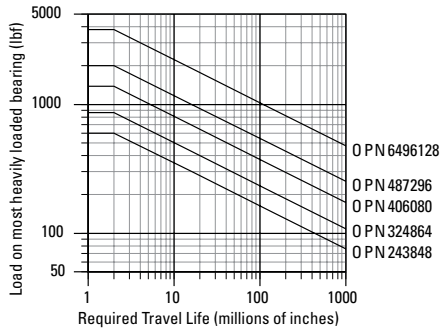
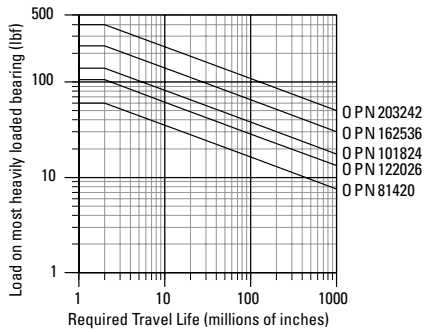
(1) For part number description and specifications, see page 84.

(2) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs.



Load/Life Graph

(Lines indicate limiting load for given Ball Bushing® Bearing)



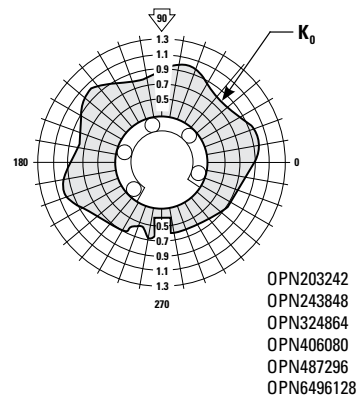
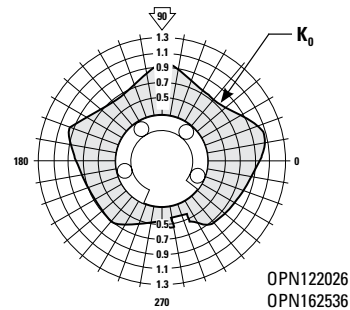
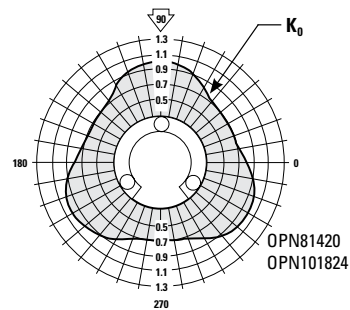
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing size, enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

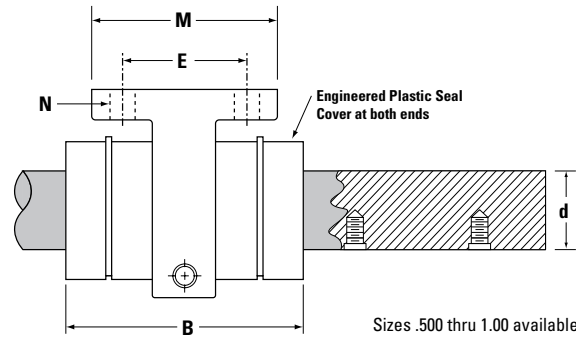
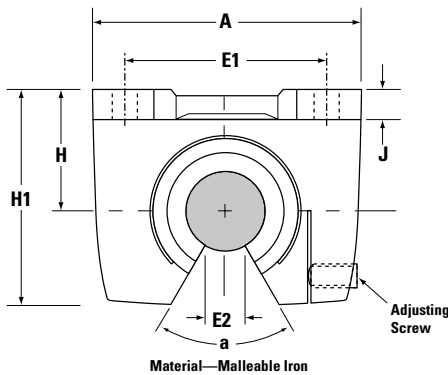
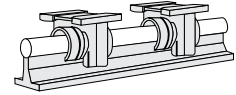
Polar Graphs

The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.



Thomson RoundRail Linear Guides and Components

Precision Steel Ball Bushing Bearing Pillow Block (Open Type) for Continuously Supported Applications



Sizes .500 thru 1.00 available in Corrosion resistant Stainless Steel.

Precision Steel Ball Bushing Bearing Pillow Blocks (Open Type, seal at both ends) and 60 Case® LinearRace® (Dim. in inches)

Part Number ⁽¹⁾		Nominal Diameter	H ±.005	H1
Precision Steel Ball Bushing Pillow Block	60 Case LinearRace*			
PBO80PN	1/2 L PD	.500	.875	1.50
PBO120PN	3/4 L PD	.750	1.125	2.00
PBO160PN	1 L PD	1.000	1.375	2.38
PBO200PN	1 1/4 L PD	1.250	1.750	3.06
PBO240PN	1 1/2 L PD	1.500	2.000	3.50
PBO320PN	2 L PD	2.000	2.500	4.50

* 60 Case begins on page 174.

Part Number ⁽¹⁾	60 Case LinearRace Diameter d	A	B	E ±.010	E1 ±.010	E2 min.	J	α deg	M	N		Pillow Block Weight lb	Dynamic ⁽²⁾ Load Capacity lb _r
										Hole	Bolt		
PBO80PN	.4995/.4990	2.00	1.69	1.000	1.500	.37	.25	50	1.50	.19	#8	.4	60
PBO120PN	.7495/.7490	2.75	2.06	1.375	2.000	.43	.31	60	2.00	.22	#10	1.0	140
PBO160PN	.9995/.9990	3.25	2.88	1.500	2.500	.56	.38	60	2.25	.28	1/4	1.8	240
PBO200PN	1.2495/1.2490	4.00	3.63	1.875	3.000	.67	.44	50	2.75	.34	5/16	3.8	400
PBO240PN	1.4994/1.4989	4.75	4.00	2.000	3.5000	.81	.50	50	3.00	.34	5/16	4.8	600
PBO320PN	1.9994/1.9987	6.00	5.00	2.500	4.500	1.00	.63	50	3.50	.41	3/8	8.5	860

(1) For part number description and specifications, see page 84.

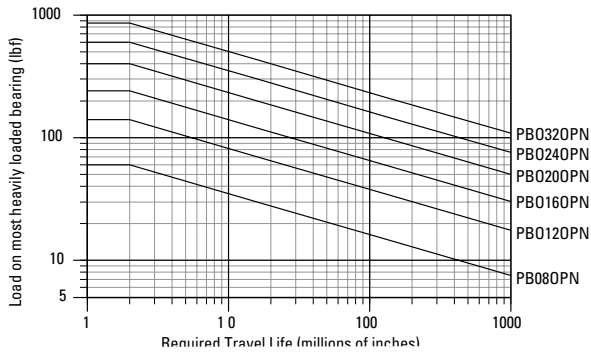
(2) The Dynamic Load Capacity is based on a rated travel life of 2 million inches. The actual Dynamic Load Capacity can be affected by the orientation of the bearing or the direction of the applied load. For Dynamic Load Correction Factors, see following polar graphs.

Note: Check bearing clearance when using Thomson low support rail.



Load/Life Graph

(Lines indicate limiting load for given Ball Bushing® Bearing)



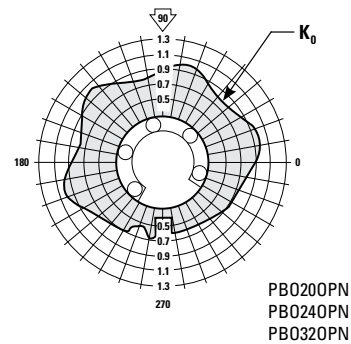
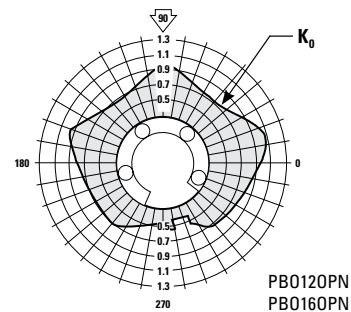
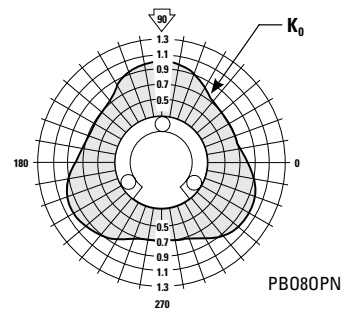
Determining Ball Bushing Bearing Size

To determine the proper Ball Bushing Bearing size, enter the chart with the maximum load of the most heavily loaded bearing and the required travel life. Mark where the two lines intersect. All Ball Bushing Bearing sizes that pass through or above and to the right of this point may be suitable for this application.

Note: For the purpose of using this chart, load on most heavily loaded bearing = maximum applied load/ K_0 . Where K_0 can be determined from the Polar Graph to the right.

Polar Graphs

The actual dynamic load capacity of a Ball Bushing Bearing is determined by the orientation of the bearing or direction of the applied load. The load correction factor K_0 is found by knowing the direction of the applied load relative to the orientation of the bearings ball tracks and referring to the polar graph. To determine the actual dynamic load capacity, multiply the proper correction factor by the dynamic load capacity listed in the product table on the previous page.



Wire Straightening/Feeding Mechanism

Objective

Redesign a wire straightening/feeding mechanism for a wire drawing machine that improves cycle time and minimizes downtime.

Solution

Combine the performance advantages of the Precision Steel Ball Bushing Bearing with the operating efficiency of Thomson ball screws.

Products Specified

4 - A162536 (Precision Steel Ball Bushing Bearings)

2 - 1 S CTL (60 Case® LinearRace®)

1 - .625 x .200 (Thomson ball screw assembly)

Benefits

By replacing high-friction plain bearings with Precision Steel Ball Bushing Bearings, service life increased from six months to four years. This significantly reduced downtime and maintenance requirements and provided increased productivity.

