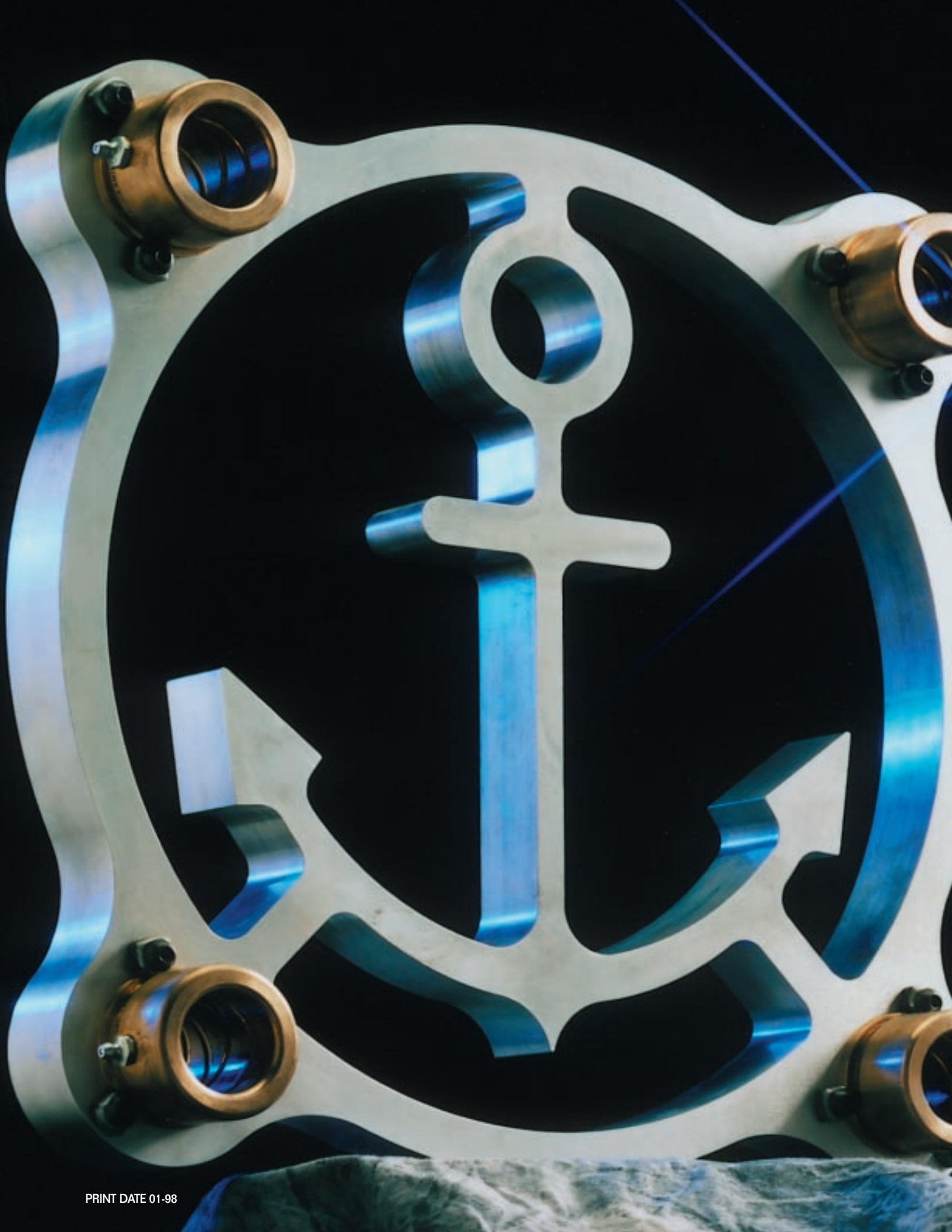




**ANCHOR  
LAMINA  
INC.**

**BALL  
BEARING  
DIE SETS**







# Certificate of Registration

*This is to certify that KPMG Quality Registrar has registered the Quality System of*

## **ANCHOR LAMINA INC.**

**WINDSOR**

**MISSISSAUGA**

**CAMBRIDGE**

*to the Quality System Standard*

**ISO 9002:1994**

*The Quality System is applicable to*

**Manufacture and distribution of die sets, sized steel plate and diemaker accessories  
and services including special machining and stress relieving**

This registration is given subject to the terms and conditions governing the use of the certificate as described in the agreement between KPMG Quality Registrar Inc. and the holder thereof. Registration does not assure the effectiveness of the Quality System or the products or services produced by it.



A handwritten signature in black ink that reads "Mark J. O'Sullivan".

Mark J. O'Sullivan  
President  
KPMG Quality Registrar Inc.  
Toronto, Ontario, Canada M5L 1B2





## GENERAL INFORMATION

1. The Ball Retainer travels one-half the distance the pin travels or one-half the stroke.
2. Anchor Ball Bearing Components may be returned for 75% credit provided they are standard as shown on pages 4 and 5. Return freight prepaid.
3. Anchor Ball Bearing Die Sets are not stocked, they are made to order only and may not be returned for credit.
4. Original die set accuracy is often altered by removal of large quantities of material in the die shop. It is recommended that these operations be roughed in at our plant before the die set is finished ground, bored and assembled.



## ANCHOR BALL BEARING ENGINEERING DATA

### SPECIFICATIONS

1. Maximum Shut Height – See Figure 2, below.
2. Minimum Shut Height – See Figure 1.
3. Stroke – See Figures 2 and 3.
4. Maximum Open Height – See Figures 2 and 3.
  - A. Lay out die as in Figure 1 (Minimum Shut Height). This determines maximum guide post length and maximum bushing height.
  - B. Lay out die as in Figure 2 (Maximum Shut Height).
  - C. Maximum Open Height (Maximum Shut Height plus Stroke) as in Figure 3 shows minimum guide post engagement in bushing that is required. If this is at least 3/4" then conditions are ideal. However, if this dimension is less than 3/4" then Figure 4 should be considered. Actual work is done for only a fraction of the total stroke on most dies and if conditions shown in Figure 4 are satisfied in conjunction with Figure 1 and Figure 2 then full length of stroke and maximum open height can be disregarded.

### General Die Set Design Procedures

NOTE LONGER THAN NORMAL STROKES MAY BE UTILIZED BY DISENGAGING GUIDE POST AND, IF ABSOLUTELY NECESSARY, THE RETAINER FROM BUSHING ON THE UPWARD TRAVEL PROVIDED:

- 1 – OPERATION IS VERTICAL, AND 2 – OPERATION IS NOT FASTER THAN 150 STROKES PER MINUTE.

ON INCLINED OPERATIONS, OR AT SPEEDS IN EXCESS OF 150 STROKES PER MINUTE, THE GUIDE POST MUST ENGAGE THE BUSHING AT ALL TIMES AT LEAST 3/4" (THE RETAINER MUST BE ENGAGED BY THE GUIDE POST AND BUSHING AT ALL TIMES).

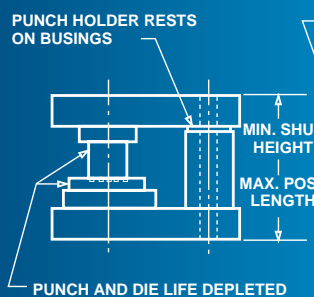


Figure 1

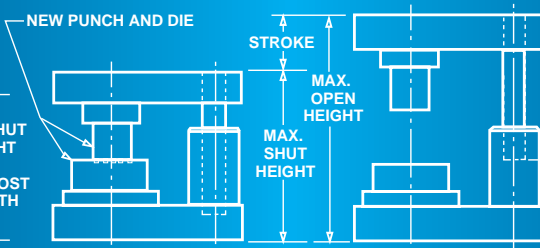


Figure 2

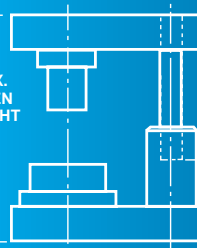


Figure 3

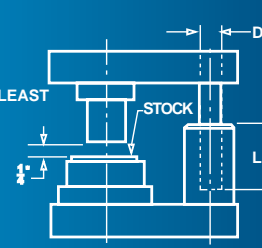
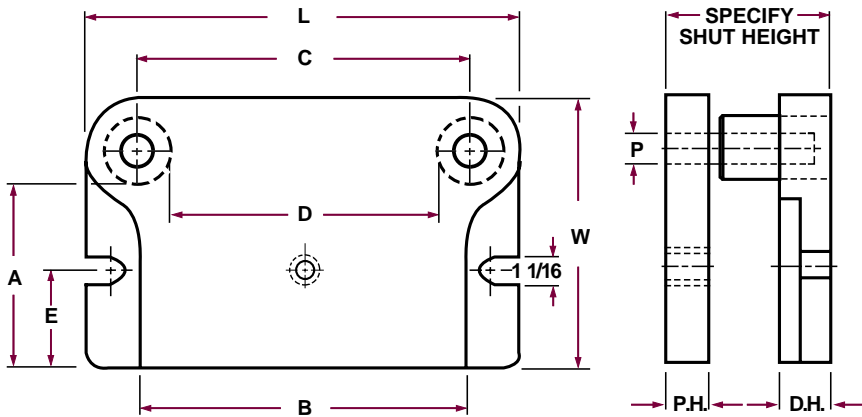


Figure 4

"L" SHOULD BE 1 1/2 TIMES "D" WHEN PUNCH IS 1/4" ABOVE STOCK

# STANDARD

## BALL BEARING DIE SETS

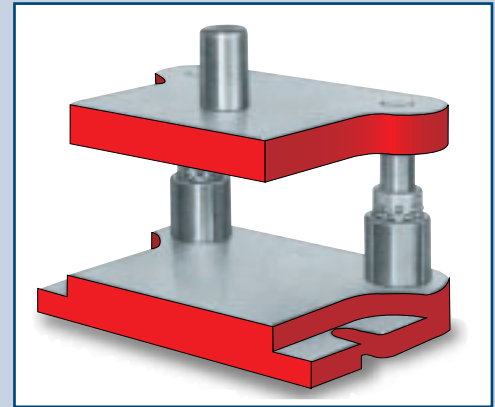


PRICES AVAILABLE ON REQUEST – F.O.B. OUR PLANT  
SALES TAX EXTRA IF APPLICABLE

Standard Ball Bearing Die Sets are made to order and may not be returned for credit.

A	B	C	D	E	L	W	P.H.	D.H.	PIN	
									Dia.	Length
3 1/2	6	6	4	2	9	6	1 1/4	1 1/2	1	D E P E N D S  O N  S H U T  H E I G H T  A N D  S T R O K E
3 1/2	10	10	8	2	13	6	1 1/4	1 1/2	1	
4 1/2	5	5	3	2 1/2	8	7	1 1/4	1 1/2	1	
4 1/2	9	9	7	2 1/2	12	7	1 1/4	1 1/2	1	
4 1/2	13	13	10 1/2	2 1/2	16 1/2	7 1/2	1 1/2	1 3/4	1 1/4	
5 1/2	6	6	4	3	9	8	1 1/4	1 1/2	1	
5 1/2	8	8	6	3	11	8	1 1/4	1 1/2	1	
5 1/2	10	10	7 1/2	3	13 1/2	8 1/2	1 1/2	1 3/4	1 1/4	
6 1/2	7	7	4 1/2	3 1/2	10 1/2	9 3/8	1 1/4	1 1/2	1 1/4	
6 1/2	9	9	6 1/2	3 1/2	13	9 3/4	1 1/2	1 3/4	1 1/4	
6 1/2	11	11	8 1/2	3 1/2	14 1/2	9 1/2	1 1/2	1 3/4	1 1/4	
6 1/2	13	13	10 1/2	3 1/2	16 1/2	9 1/2	1 1/2	1 3/4	1 1/4	
7 1/2	8	8	5 1/2	4	11 1/2	10 1/2	1 1/2	1 3/4	1 1/4	
7 1/2	10	10	7 1/2	4	13 1/2	10 3/8	1 1/2	1 3/4	1 1/4	
7 1/2	12	12	9 1/2	4	15 3/8	10 1/2	1 3/4	2	1 1/4	
8 1/2	9	9	6 1/2	4 1/2	12 1/2	11 3/8	1 1/2	1 3/4	1 1/4	
8 1/2	11	11	8 1/2	4 1/2	14 1/2	11 1/2	1 3/4	2	1 1/4	
8 1/2	13	13	10 1/4	4 1/2	16 3/4	11 3/4	1 3/4	2	1 1/2	
8 1/2	15	15	12 1/4	4 1/2	19	12	1 3/4	2	1 1/2	
9 1/2	8	8	5 1/2	5	11 1/2	12 1/2	1 1/2	1 3/4	1 1/4	
9 1/2	10	10	7 1/2	5	13 1/2	12 3/8	1 3/4	2	1 1/4	
9 1/2	12	12	9 1/4	5	16	13	1 3/4	2	1 1/2	
11 1/2	8	8	5 1/4	6	11 3/4	14 3/8	1 3/4	2	1 1/2	
11 1/2	10	10	7 1/4	6	13 3/4	14 3/4	1 3/4	2	1 1/2	
11 1/2	12	12	9 1/4	6	15 3/4	14 3/4	2	2 1/4	1 1/2	
11 1/2	15	15	12 1/4	6	18 3/4	14 3/4	2	2 1/4	1 1/2	

OTHER SIZES AVAILABLE TO YOUR SPECIFICATIONS



Anchor Ball Bearing Die Sets are made to traditionally high manufacturing requirements which have determined quality standards in the die set industry.

Anchor's Precision Retainer is made of heat-treated aluminum alloys with chrome alloy steel balls.

Anchor's Guide Posts and Bushings are manufactured to rigid standards using the highest quality steel alloys.

### SHANKS AVAILABLE

1 1/2 dia. x 2 1/8	(1 1/4-12 NF)
2 dia. x 2 7/8	(1 1/4-12 NF)
2 1/2 dia. x 2 7/8	(1 1/2-12 NF)
3 dia. x 3	(1 1/2-12 NF)

### When Ordering Specify:

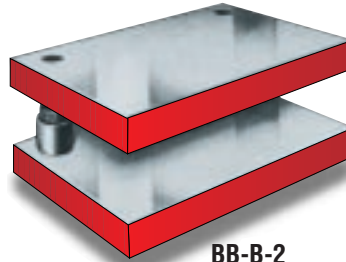
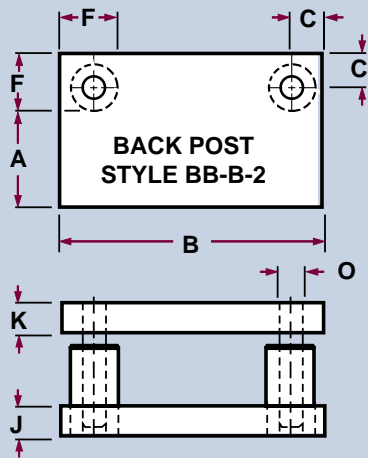
1. Style "Standard"
2. Dimension A & B
3. Thickness P.H. and D.H.
4. Minimum Shut Height
5. Stroke of Press
6. Size and location of Shank if required.



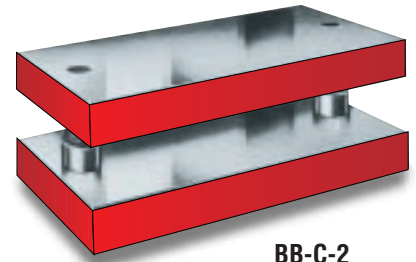
# ANCHOR BALL BEARING

# DIE SETS

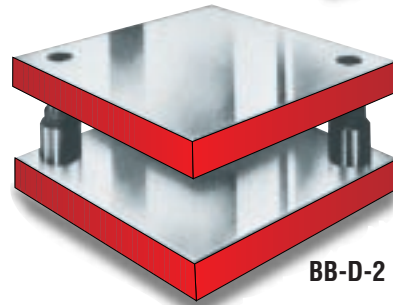
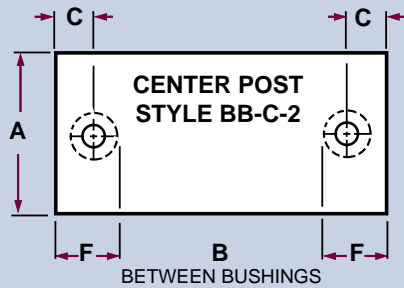
## TWO POST STYLES



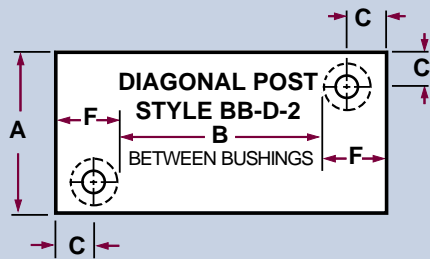
BB-B-2



BB-C-2



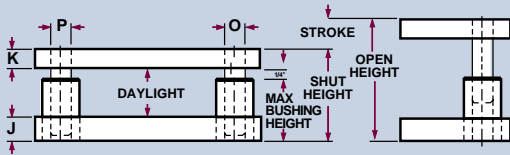
BB-D-2



QUALIFIED REPRESENTATIVES AVAILABLE TO QUOTE YOUR REQUIREMENTS.

### SUGGESTED MINIMUM DIMENSIONS

WHEN	B= 6 to 11"				B= 12 to 17"				B= 18 to 23"				B= 24 to 29"			
A =	J	K	O	P	J	K	O	P	J	K	O	P	J	K	O	P
6 to 8"	1½	1½	1¼	1	1½	1½	1¼	1	1½	1½	1½	1¼	1½	1½	1½	1¼
9 to 11"	1½	1½	1½	1¼	1½	1½	1½	1¼	1¾	1¾	1¾	1½	1¾	1¾	1¾	1½
12 to 17"					1¾	1¾	1¾	1½	2	2	2	1¾	2	2	2	1¾
18 to 23"									2	2	2	1¾	2½	2½	2½	2
24 to 29"													2½	2½	2½	2
30 to 44"																
45 to 60"																



### DIMENSIONAL VARIATIONS

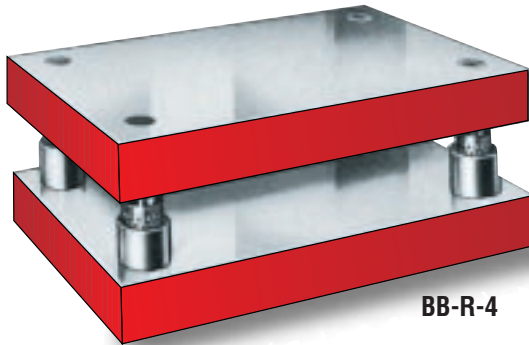
GUIDE POST	1	1¼	1½	1¾	2	2½	3
F	2⅜	2⅞	3¼	3½	4	4½	5⅞
C	1½	1¾	2	2⅞	2⅞	2⅞	3

WHEN	B= 30 to 44"				B= 45 to 69"				B= 70 to 100"			
A =	J	K	O	P	J	K	O	P	J	K	O	P
6 to 8"	1¾	1¾	1¾	1½	2	2	2	1¾	2	2	2	1¾
9 to 11"	2	2	2	1¾	2	2	2	1¾	2	2	2	1¾
12 to 17"	2½	2½	2½	2	2½	2½	2½	2	2½	2½	2½	2
18 to 23"	2½	2½	2½	2	2½	2½	2½	2	2½	2½	2½	2
24 to 29"	2½	2½	2½	2	3	3	3	2½	3	3	3	2½
30 to 44"	3	3	2½	2	3	3	3	2½	3	3	3	2½
45 to 60"					3	3	3	2½	3½	3½	3	2½

# ANCHOR BALL BEARING

# DIE SETS

## FOUR POST STYLES



BB-R-4

**SPECIAL DIE SETS ARE  
MANUFACTURED IN ANY SIZE OR SHAPE TO  
YOUR SPECIFICATIONS**

**ALL ANCHOR DIE SETS ARE STRESS RELIEVED**

### SUGGESTED MINIMUM DIMENSIONS

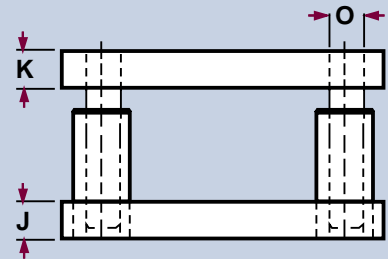
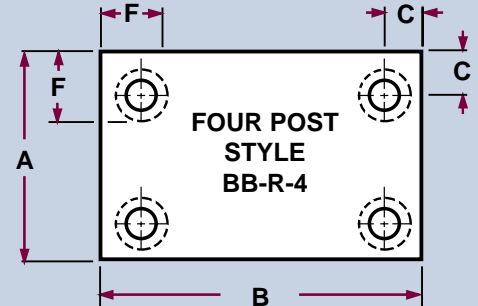
WHEN A =	B= 6 to 11"			B= 12 to 17"			B= 18 to 23"			B= 24 to 29"		
	J	K	O	J	K	O	J	K	O	J	K	O
6 to 8"	1 1/4	1	1	1 1/2	1	1 1/4	1 1/2	1 1/4	1 1/2	1 1/2	1 1/4	1 3/4
9 to 11"	1 1/2	1	1	1 1/2	1 1/4	1 1/4	1 1/2	1 1/4	1 1/2	1 3/4	1 1/2	1 3/4
12 to 17"				1 1/2	1 1/4	1 1/4	1 3/4	1 1/2	1 1/2	1 3/4	1 1/2	1 3/4
18 to 23"							1 3/4	1 1/2	1 1/2	2	1 3/4	1 3/4
24 to 29"										2	1 3/4	1 3/4
30 to 44"												
45 to 60"												

WHEN A =	B= 30 to 44"			B= 45 to 69"			B= 70 to 100"		
	J	K	O	J	K	O	J	K	O
6 to 8"	1 3/4	1 1/2	2	2	1 1/2	2			
9 to 11"	1 3/4	1 1/2	2	2	1 1/2	2	2 1/2	1 3/4	2 1/2
12 to 17"	2	1 3/4	2	2 1/2	1 3/4	2	2 1/2	2	2 1/2
18 to 23"	2	1 3/4	2	2 1/2	1 3/4	2	3	2	2 1/2
24 to 29"	2 1/2	2	2	2 1/2	2	2	3	2	2 1/2
30 to 44"	2 1/2	2	2	3	2	2	3 1/2	2 1/2	2 1/2
45 to 60"				3	2	2	3 1/2	2 1/2	2 1/2

**IMPORTANT  
YOUR ORDER  
CANNOT BE  
PROCESSED  
WITHOUT THIS  
INFORMATION**

### When Ordering Specify:

1. Style required
2. Dimension A & B
3. Thickness P.H. (K) and D.H. (J)
4. Minimum Shut Height
5. Stroke of Press
6. Size & Location of shank if required

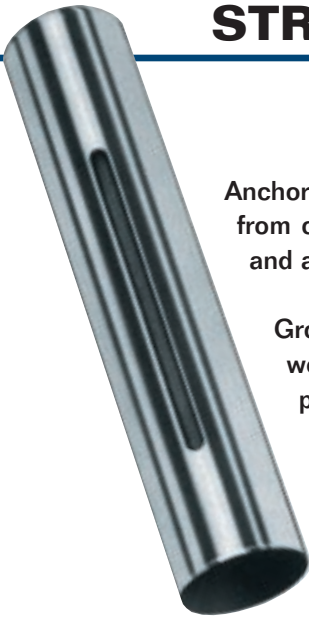


### SHANKS AVAILABLE

- |                    |               |
|--------------------|---------------|
| 1 1/2 dia. x 2 1/8 | (1 1/4-12 NF) |
| 2 dia. x 2 7/8     | (1 1/4-12 NF) |
| 2 1/2 dia. x 2 7/8 | (1 1/2-12 NF) |
| 3 dia. x 3         | (1 1/2-12 NF) |

# STRAIGHT GUIDE POSTS

## #AP1 Series



Anchor Lamina's Precision Guide Posts (AP1) for ball bearing assemblies are made from chrome alloy steel, hardened to provide maximum protection against tracking and accelerated wear.

Ground to a high degree of tolerance accuracy that also provides a smooth hard wearing surface to assure free rolling of balls to maintain constant, predictable preload and complete interchangeability, not only with our own but other manufacturers' also.

**NOTE: Guide posts are 1/8" shorter than nominal.**

Nom Post Diameter	Length	Catalog Number	Nom Post Diameter	Length	Catalog Number	Nom Post Diameter	Length	Catalog Number
3/4" (.7529)	3	AP1-0612	1 1/2" (1.5029)	4 1/2	AP1-1218	2" (2.0029)	5 1/2	AP1-1622
	3 1/4	AP1-0613		4 3/4	AP1-1219		6	AP1-1623
	3 1/2	AP1-0614		5	AP1-1220		6 1/4	AP1-1624
	3 3/4	AP1-0615		5 1/4	AP1-1221		6 1/2	AP1-1625
	4	AP1-0616		5 1/2	AP1-1222		6 3/4	AP1-1626
	4 1/4	AP1-0617		5 3/4	AP1-1223		7	AP1-1627
	4 1/2	AP1-0618		6	AP1-1224		7 1/4	AP1-1628
	4 3/4	AP1-0619		6 1/2	AP1-1226		7 1/2	AP1-1629
	5	AP1-0620		7	AP1-1228		7 3/4	AP1-1630
	5 1/2	AP1-0622		7 1/2	AP1-1230		8	AP1-1632
	6	AP1-0624		8	AP1-1232		8 1/2	AP1-1634
	1" (1.0029)	3 3/4		AP1-0815	8 1/2		AP1-1234	9
4		AP1-0816	9	AP1-1236	9 1/2	AP1-1638		
4 1/4		AP1-0817	9 1/2	AP1-1238	10	AP1-1640		
4 1/2		AP1-0818	10	AP1-1240	10 1/2	AP1-1642		
4 3/4		AP1-0819	10 1/2	AP1-1242	11	AP1-1644		
5		AP1-0820	11	AP1-1244	11 1/2	AP1-1646		
5 1/4		AP1-0821	11 1/2	AP1-1246	12	AP1-1648		
5 1/2		AP1-0822	12	AP1-1248	12 1/2	AP1-1650		
5 3/4		AP1-0823	12 1/2	AP1-1250	13	AP1-1652		
6		AP1-0824	13	AP1-1252	14	AP1-1656		
6 1/2		AP1-0826	14	AP1-1256	15	AP1-1660		
7		AP1-0828	1 3/4" (1.7529)	5	AP1-1420	2.5" (2.5029)	16	AP1-1664
7 1/2	AP1-0830	5 1/4		AP1-1421	17		AP1-1668	
8	AP1-0832	5 1/2		AP1-1422	18		AP1-1672	
8 1/2	AP1-0834	5 3/4		AP1-1423	8		AP1-2032	
9	AP1-0836	6		AP1-1424	8 1/2		AP1-2034	
1 1/4" (1.2529)	4 1/2	AP1-1018		6 1/2	AP1-1425		9	AP1-2036
	4 3/4	AP1-1019		7	AP1-1426		10	AP1-2040
	5	AP1-1020		7 1/2	AP1-1428		11	AP1-2044
	5 1/4	AP1-1021		8	AP1-1430		12	AP1-2048
	5 1/2	AP1-1022		8 1/2	AP1-1432		13	AP1-2052
	5 3/4	AP1-1023		9	AP1-1434		14	AP1-2056
	6	AP1-1024		10	AP1-1436		17	AP1-2068
	6 1/2	AP1-1026	10 1/2	AP1-1440	20	AP1-2080		
	7	AP1-1028	11	AP1-1442	3" (3.0029)	8	AP1-2432	
	7 1/2	AP1-1030	11 1/2	AP1-1444		8 1/2	AP1-2434	
	8	AP1-1032	12	AP1-1446		9	AP1-2436	
	8 1/2	AP1-1034	12 1/2	AP1-1448		10	AP1-2440	
9	AP1-1036	13	AP1-1450	11		AP1-2444		
10	AP1-1040	14	AP1-1452	12		AP1-2448		
11	AP1-1044	15	AP1-1456	13		AP1-2452		
12	AP1-1048	17	AP1-1468	14		AP1-2456		
				15		AP1-2468		
				17		AP1-2480		

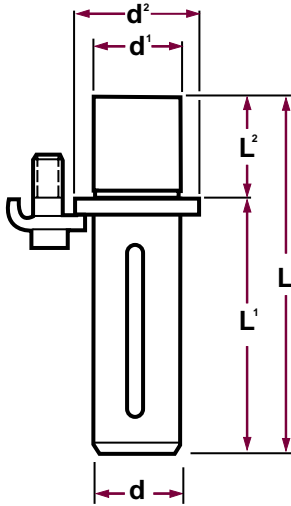


# DEMOUNTABLE GUIDE POSTS

## #APD-unground\* #APG-finished ground

.015 grind stock on d' dimension

- large savings in maintenance, repair costs and downtime
- a wide variety of sizes
- long, trouble free production runs
- highest quality workmanship and materials
- "d1" dimension is finished ground
- flange should be ground flat when grinding the "d1" dimension to assure a square surface when seating the pin



**NOTE: Guide posts are 1/8" shorter than nominal.**

Nom Post Dia. d	Flange d <sup>2</sup>	d <sup>1</sup>	L <sup>2</sup>	L <sup>1</sup>	L	Catalog Number	Nom Post Dia. d	Flange d <sup>2</sup>	d <sup>1</sup>	L <sup>2</sup>	L <sup>1</sup>	L	Catalog Number								
1" (1.003)	1 5/16	1.0011 1.0006	1 3/16	2 1/2	3 3/4	APG0815	1 3/4 (1.753)	2 1/4	1.7511 1.7506	1 11/16	5 3/4	7 1/2	APG1430								
				2 3/4	4	APG0816					6 1/4	8	APG1432								
				3	4 1/4	APG0817					6 3/4	8 1/2	APG1434								
				3 1/4	4 1/2	APG0818					7 1/4	9	APG1436								
				3 1/2	4 3/4	APG0819					7 3/4	9 1/2	APG1438								
				3 3/4	5	APG0820					8 1/4	10	APG1440								
				4	5 1/4	APG0821					8 3/4	10 1/2	APG1442								
				4 1/4	5 1/2	APG0822					9 1/4	11	APG1444								
				4 1/2	5 3/4	APG0823					9 3/4	11 1/2	APG1446								
				4 3/4	6	APG0824					10 1/4	12	APG1448								
				5 1/4	6 1/2	APG0826					10 3/4	12 1/2	APG1450								
				5 3/4	7	APG0828					11 1/4	13	APG1452								
				6 1/4	7 1/2	APG0830					12 1/4	14	APG1456								
				6 3/4	8	APG0832					13 1/4	15	APG1460								
				7 1/4	8 1/2	APG0834					15 1/4	17	APG1468								
				7 3/4	9	APG0836															
				1 1/4" (1.253)	1 9/16	1.2511 1.2506					1 3/16	3 1/4	4 1/2	APG1018	2" (2.003)	2 1/2"	2.0011 2.0006	1 15/16"	3 1/2	5 1/2	APG1622
3 1/2	4 3/4	APG1019	3 3/4				5 3/4	APG1623													
3 3/4	5	APG1020	4				6	APG1624													
4	5 1/4	APG1021	4 1/4				6 1/4	APG1625													
4 1/4	5 1/2	APG1022	4 1/2				6 1/2	APG1626													
4 1/2	5 3/4	APG1023	4 3/4				6 3/4	APG1627													
4 3/4	6	APG1024	5				7	APG1628													
5 1/4	6 1/2	APG1026	5 1/4				7 1/4	APG1629													
5 3/4	7	APG1028	5 1/2				7 1/2	APG1630													
6 1/4	7 1/2	APG1030	5 3/4				7 3/4	APG1631													
6 3/4	8	APG1032	6				8	APG1632													
7 1/4	8 1/2	APG1034	6 1/2				8 1/2	APG1634													
7 3/4	9	APG1036	7	9	APG1636																
8 3/4	10	APG1040	7 1/2	9 1/2	APG1638																
9 3/4	11	APG1044	8	10	APG1640																
10 3/4	12	APG1048	8 1/2	10 1/2	APG1642																
			9	11	APG1644																
			9 1/2	11 1/2	APG1646																
			10	12	APG1648																
			10 1/2	12 1/2	APG1650																
			11	13	APG1652																
			12	14	APG1656																
			13	15	APG1660																
			14	16	APG1664																
			15	17	APG1668																
			16	18	APG1672																
1 1/2" (1.503)	1 7/8	1.5011 1.5006	1 7/16	3	4 1/2	APG1218	2 1/2" (2.503)	3	2.5011 2.5006	1 15/16"	6	8	APG2032								
				3 1/4	4 3/4	APG1219					6 1/2	8 1/2	APG2034								
				3 1/2	5	APG1220					7	9	APG2036								
				3 3/4	5 1/4	APG1221					8	10	APG2040								
				4	5 1/2	APG1222					8 1/2	10 1/2	APG2044								
				4 1/4	5 3/4	APG1223					9	11	APG2048								
				4 1/2	6	APG1224					9 1/2	11 1/2	APG2052								
				5	6 1/2	APG1226					10	12	APG2056								
				5 1/2	7	APG1228					10 1/2	12 1/2	APG2068								
				6	7 1/2	APG1230					11	13	APG2080								
				6 1/2	8	APG1232					11 1/2	14	APG2088								
				7	8 1/2	APG1234					12 1/2	15	APG2104								
7 1/2	9	APG1236	13	16	APG2120																
8	9 1/2	APG1238	14	17	APG2136																
8 1/2	10	APG1240	15	18	APG2152																
9	10 1/2	APG1242	16	19	APG2168																
9 1/2	11	APG1244	17	20	APG2184																
10	11 1/2	APG1246	18	21	APG2200																
10 1/2	12	APG1248	19	22	APG2216																
11	12 1/2	APG1250	20	23	APG2232																
11 1/2	13	APG1252	21	24	APG2248																
12 1/2	14	APG1256	22	25	APG2264																
1 3/4" (1.753)	2 1/4	1.7511 1.7506	1 11/16	3 1/4	5	APG1420	3" (3.003)	3 1/2	3.0011 3.0006	2 7/16"	5 1/2	8	APG2432								
				3 1/2	5 1/4	APG1421					6 1/2	9	APG2436								
				3 3/4	5 1/2	APG1422					7 1/2	10	APG2440								
				4	5 3/4	APG1423					8 1/2	11	APG2444								
				4 1/4	6	APG1424					9 1/2	12	APG2448								
				4 1/2	6 1/4	APG1425					10 1/2	13	APG2452								
				4 3/4	6 1/2	APG1426					11 1/2	14	APG2456								
5 1/4	7	APG1428	14 1/2	17	APG2468																
			17 1/2	20	APG2480																



# STRAIGHT SLEEVE BUSHINGS

## #AB1 Series

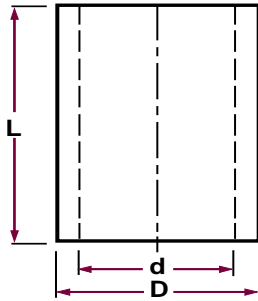
Anchor Lamina's Ball Bearing Guide Assembly Bushings (AB1) are made from vacuum degassed chrome alloy steel, hardened to precise Rockwell limits to give minimum tracking, grooving and downtime.

Anchor Lamina's ball bushings are ground and honed to exacting tolerance limits. Using high tech electronic and air checking instruments on I.D. and O.D. make them interchangeable and do not require select fitting.

The top is chamfered on I.D. to minimize wear and aid alignment when disengagement is required.

To minimize bushing close-in which is a result of press fit and to eliminate any additional grinding or honing, boring instructions are provided in this catalog.

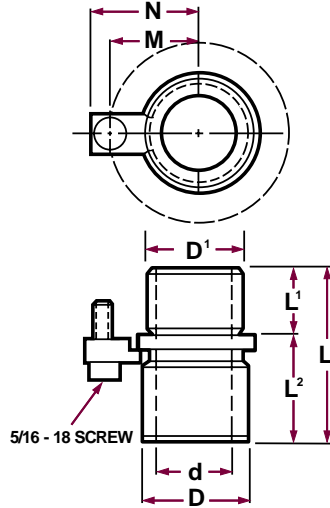
**NOTE: Straight sleeve bushings are 1/8" shorter than nominal.**



Nom Post Diameter	D	d	L	Catalog Number	Nom Post Diameter	D	d	L	Catalog Number	Nom Post Diameter	D	d	L	Catalog Number					
3/4"	1.387	1.1268	1 3/4	AB1-0607	1 1/2"	2.437	1.8765	3	AB1-1212	2"	3.162	2.5015	3	AB1-1612					
			2	AB1-0608				3 1/4	AB1-1213				3 1/2	AB1-1614					
			2 1/4	AB1-0609				3 1/2	AB1-1214				3 3/4	AB1-1615					
			2 1/2	AB1-0610				4	AB1-1215				4	AB1-1616					
			2 3/4	AB1-0611				4 1/4	AB1-1216				4 1/4	AB1-1617					
			3	AB1-0612				4 1/2	AB1-1217				4 1/2	AB1-1618					
			3 1/4	AB1-0613				4 3/4	AB1-1218				4 3/4	AB1-1619					
			3 1/2	AB1-0614				5	AB1-1219				5	AB1-1620					
			3 3/4	AB1-0615				5 1/4	AB1-1220				5 1/2	AB1-1621					
			4	AB1-0616				5 1/2	AB1-1221				5 1/2	AB1-1622					
			4 1/2	AB1-0618				6	AB1-1222				6	AB1-1624					
			5	AB1-0620				6 1/2	AB1-1223				6 1/2	AB1-1626					
			6	AB1-0624				7	AB1-1224				7	AB1-1628					
			1"	1.717				1.3768	2				AB1-0808	1 3/4"	2.747	2.1265	6 1/2	AB1-1226	2 1/2"
2 1/4	AB1-0809	7			AB1-1228	8	AB1-1632												
2 1/2	AB1-0810	7 1/2			AB1-1230	8 1/2	AB1-1634												
2 3/4	AB1-0811	8			AB1-1232	9	AB1-1636												
3	AB1-0812	8 1/2			AB1-1234	9 1/2	AB1-1638												
3 1/4	AB1-0813	9			AB1-1236	10	AB1-1640												
3 1/2	AB1-0814	10			AB1-1240	10 1/2	AB1-1642												
3 3/4	AB1-0815	10 1/2			AB1-1242	11	AB1-1644												
4	AB1-0816	11			AB1-1244	12	AB1-1648												
4 1/4	AB1-0817	12			AB1-1248	13	AB1-1652												
4 1/2	AB1-0818	3			AB1-1412	14	AB1-1656		3"	4.182	3.5015	6	AB1-2024						
4 3/4	AB1-0819	3 1/2			AB1-1414	6 1/2	AB1-2026												
5	AB1-0820	3 3/4			AB1-1415	7	AB1-2028												
5 1/2	AB1-0822	4			AB1-1416	7 1/2	AB1-2030												
6	AB1-0824	4 1/4	AB1-1417	8	AB1-2032														
6 1/2	AB1-0826	4 1/2	AB1-1418	8 1/2	AB1-2034														
7	AB1-0828	4 3/4	AB1-1419	9	AB1-2036														
2 1/2	AB1-1010	4 1/2	AB1-1418	9 1/2	AB1-2038														
2 3/4	AB1-1011	4 3/4	AB1-1419	10	AB1-2040														
3	AB1-1012	5	AB1-1420	10 1/2	AB1-2042														
3 1/4	AB1-1013	5 1/4	AB1-1421	11	AB1-2044														
3 1/2	AB1-1014	5 1/2	AB1-1422	12	AB1-2048														
3 3/4	AB1-1015	6	AB1-1424	13	AB1-2052														
4	AB1-1016	6 1/2	AB1-1426	14	AB1-2056														
4 1/4	AB1-1017	7	AB1-1428	6	AB1-2424														
4 1/2	AB1-1018	7 1/2	AB1-1430	6 1/2	AB1-2426														
4 3/4	AB1-1019	8	AB1-1432	7	AB1-2428														
5	AB1-1020	8 1/2	AB1-1434	7 1/2	AB1-2430														
5 1/2	AB1-1022	9	AB1-1436	8	AB1-2432														
6	AB1-1024	9 1/2	AB1-1438	8 1/2	AB1-2434														
6 1/2	AB1-1026	10	AB1-1440	9	AB1-2436														
7	AB1-1028	10 1/2	AB1-1442	9 1/2	AB1-2438														
8	AB1-1032	11	AB1-1444	10	AB1-2440														
9	AB1-1036	12	AB1-1448	10 1/2	AB1-2442														
		13	AB1-1452	11	AB1-2444														
				12	AB1-2448														
				13	AB1-2452														
				14	AB1-2456														

# CLAMP TYPE SHOULDER BUSHINGS - DEMOUNTABLE

## ABD-unground\* ABG-finished ground



Demountable shoulder bushings offer all the advantages of straight sleeve bushings and combine them with the convenience of easy assembly and disassembly.

These clamp type bushings are meant to be wiring fit into the die shoe and should never be forced or inserted by hammering.

Toe clamps and socket head screws are provided to hold the bushings in place.

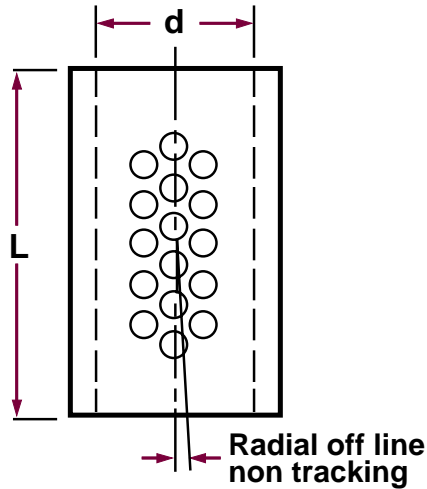
ABD unground demountable bushings are available with .015 grind stock in the "D'" dimension. Specify when ordering.

\* When ordering unground Demountable Ball Bearing Bushing please use the prefix ABD.

Nom Post Diameter	Inside Dia d	D'	D	L'	L <sup>2</sup>	M	N	L	Catalog Number	Nom Post Diameter	Inside Dia d	D'	D	L'	L <sup>2</sup>	M	N	L	Catalog Number		
1"	1.3768	1.716	1.920	1 1/8	7/8	1 7/32	1 19/32	2 Clamps	2	ABG0808	1 3/4"	2.1265	2.746	2.920	1 3/8	2 7/8	1 23/32	2 3/32	4 Clamps	4 1/4	ABG1417
					2 1/4				ABG0809	4 1/2						ABG1418					
					2 1/2				ABG0810	4 3/4						ABG1419					
					2 3/4				ABG0811	5						ABG1420					
					3				ABG0812	5 1/4						ABG1421					
					3 1/4				ABG0813	5 1/2						ABG1422					
					3 1/2				ABG0814	6						ABG1424					
					3 3/4				ABG0815	6 1/2						ABG1426					
					3 5/4				ABG0815	7						ABG1428					
1 1/4"	1.6265	2.106	2.280	1 1/8	1 3/8	1 13/32	3 Clamps	2 1/2	ABG1010	2"	2.5015	3.161	3.500	1 3/8	1 5/8	2	2 3/8	4 Clamps	3	ABG1612	
					2 3/4			ABG1011	3 1/2						ABG1614						
					3			ABG1012	3 3/4						ABG1615						
					3 1/4			ABG1013	4						ABG1616						
					3 1/2			ABG1014	4 1/4						ABG1617						
					3 3/4			ABG1015	4 1/2						ABG1618						
					4			ABG1016	4 3/4						ABG1619						
					4 1/4			ABG1017	5						ABG1620						
					4 1/2			ABG1018	5 1/4						ABG1621						
					5			ABG1020	5 1/2						ABG1622						
					5 1/2			ABG1022	6						ABG1624						
					6			ABG1024	6 1/2						ABG1626						
1 1/2"	1.8765	2.436	2.600	1 3/8	1 5/8	1 9/16	3 Clamps	3	ABG1212	2 1/2"	3.0015	3.681	4.000	1 3/8	3 5/8	2 1/4	2 5/8	4 Clamps	5	ABG2020	
					3 1/4			ABG1213	5 1/2						ABG2022						
					3 1/2			ABG1214	6						ABG2024						
					3 3/4			ABG1215	6 1/2						ABG2026						
					4			ABG1216	7						ABG2028						
					4 1/4			ABG1217	7 1/2						ABG2030						
					4 1/2			ABG1218													
					4 3/4			ABG1219													
					5			ABG1220													
					5 1/4			ABG1221													
					5 1/2			ABG1222													
					6			ABG1224													
1 3/4"	2.1265	2.746	2.920	1 3/8	1 5/8	1 23/32	4 Clamps	3	ABG1412	3"	3.5015	4.181	4.500	1 3/8	3 5/8	2 1/2	2 7/8	4 Clamps	5	ABG2420	
					2 1/8			ABG1414	6						ABG2424						
					2 3/8			ABG1415	6 1/2						ABG2426						
					2 5/8			ABG1416	7						ABG2428						
					3			ABG1416	7 1/2						ABG2430						

# PRECISION BALL BEARING RETAINERS for ROLLERBALL ASSEMBLIES

## #ARI Series



**Radial Placement reduces wear and tracking**

Anchor Lamina ball retainers (AR1) are made of a heat treated aluminum alloy that combines lightness and strength.

Each retainer is quality inspected for dimensional tolerance and all burrs are removed prior to ball insertion.

Ball bearings are of the highest quality AAA1 Grade (25 millionth class), continually inspected to meet our exacting tolerance.

After the ball bearings have been inserted into the retainer, they are then staked using Anchor Lamina's unique method that allows free movement with maximum security.

After staking, the retainers are then scrubbed to remove all metal particles that could cause accelerated tracking and grooving in the post and bushing.

Ball bearings are placed in retainers in an off-line radial pattern that offers optimum life in high or low speed presses.

Ball retainers are fastened to the guide post by means of a set screw and slot in guide post and are interchangeable with all other manufacturers using this method.

Nom Post Diameter d	Length L	Catalog Number
3/4"	1 1/2	AR1-0606
	1 3/4	AR1-0607
	2	AR1-0608
	2 1/4	AR1-0609
	* 2 1/2	AR1-0610
1"	1 1/2	AR1-0806
	1 3/4	AR1-0807
	2	AR1-0808
	2 1/4	AR1-0809
	* 2 1/2	AR1-0610
1 1/4"	2	AR1-1008
	2 1/4	AR1-1009
	2 1/2	AR1-1010
	2 3/4	AR1-1011
	3	AR1-1012
	* 3 1/4	AR1-1013
1 1/2"	2 1/2	AR1-1210
	2 3/4	AR1-1211
	3	AR1-1212
	3 1/4	AR1-1213
	3 1/2	AR1-1214
* 3 3/4	AR1-1215	
1 3/4"	2 3/4	AR1-1411
	3	AR1-1412
	3 1/4	AR1-1413
	3 1/2	AR1-1414
	3 3/4	AR1-1415
	4	AR1-1416
* 4 1/4	AR1-1417	
2"	3 1/4	AR1-1613
	3 1/2	AR1-1614
	3 3/4	AR1-1615
	4	AR1-1616
	4 1/4	AR1-1617
	* 4 1/2	AR1-1618
2 1/2"	5	AR1-2020
	5 1/2	AR1-2022
	6	AR1-2024
	6 1/2	AR1-2026
	* 7	AR1-2028
3"	5	AR1-2420
	6	AR1-2424
	* 7	AR1-2428

*An asterisk (\*) designates that the retainer length is recommended for general die set applications. Lengths not marked with an asterisk are for limited space use and special applications.*





**BALL-SCRUBB®** removes heavy soils, dirt or grease from ball-bearing guide pin assemblies.

Just spray it on ... wait 3 minutes ... and spray again. Then blow off excess with compressed air.

**BALL-LUBE®** lubricates assemblies and give them longtime protection against wear, oxidation and heat.

Spray liberally on ball bearing assemblies.

Anchor Lamina **BALL-SCRUBB®** is an industrial strength cleaner with rust inhibitors, specially formulated to clean debris and grease from all types of ball bearing assemblies.

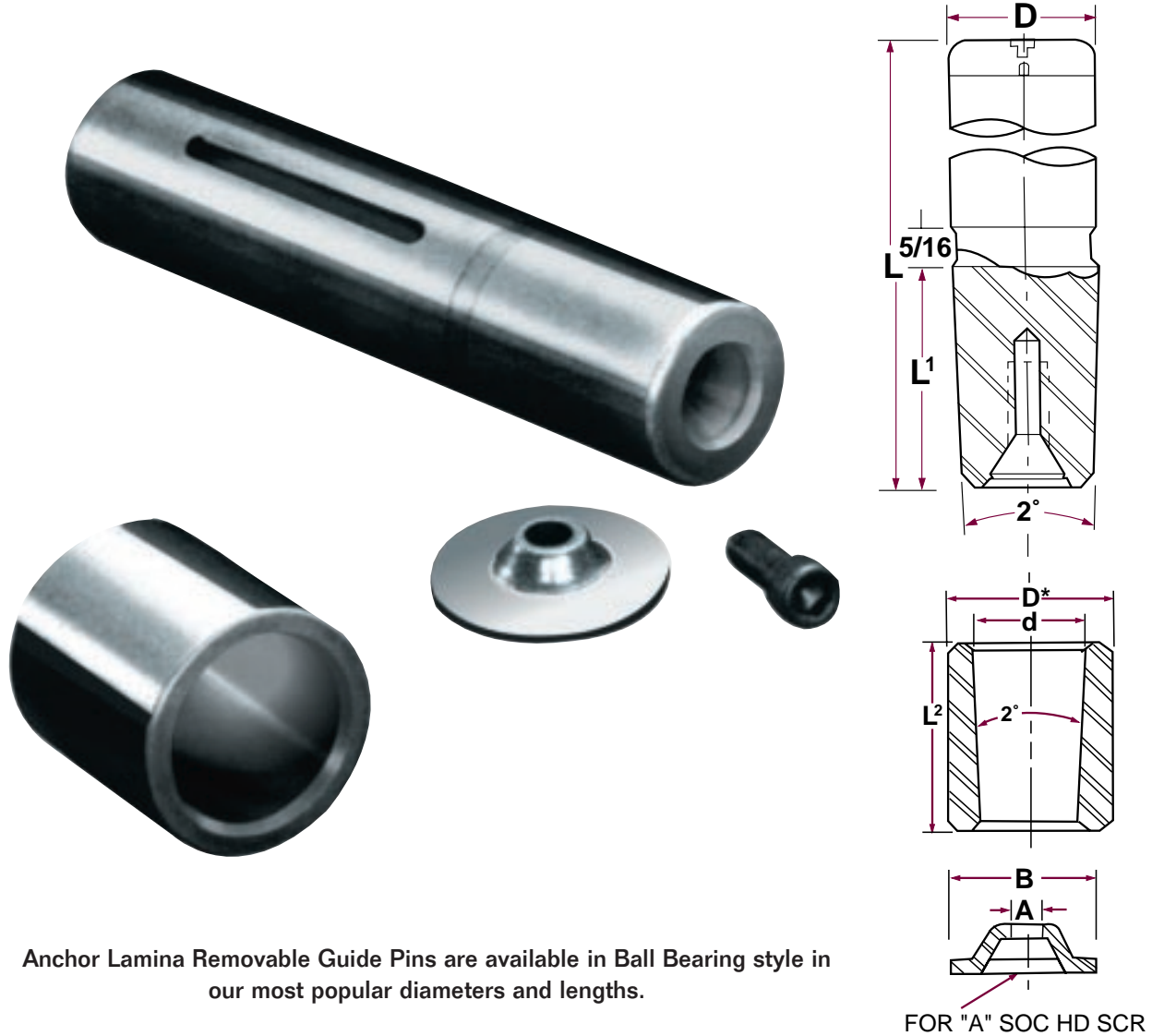
Anchor Lamina **BALL-LUBE®**, when applied after **BALL-SCRUBB®**, locks out wear by chemically bonding to precision surfaces. It provides a tough, long-lasting shield that protects against oxidation and rust.

\*Available in pints, gallons and 5 gallons.  
\*Pints are available by the case (24).

Part Number	Description
ARS016	1 Pint BALL-SCRUBB® spray
ARS384	1 Case (24) 1 Pint BALL-SCRUBB®
ARS128	1 Gallon BALL-SCRUBB®
ARS640	5 Gallons BALL-SCRUBB®
ARL016	1 Pint BALL-LUBE® spray
ARL384	1 Case (24) 1 Pint BALL-LUBE®
ARL128	1 Gallon BALL-LUBE®
ARL640	5 Gallons BALL-LUBE®

# Removable Type

## BALL BEARING GUIDE PIN



Anchor Lamina Removable Guide Pins are available in Ball Bearing style in our most popular diameters and lengths.

FOR "A" SOC HD SCR

D Nom Dia	PART NUMBER	L <sup>1</sup>	L LENGTH											
			7	7½	8	8½	9	10	11	12	13	14		
1¾	BBRP-175	2¼												
2	BBRP-200	2½												
2½	BBRP-250	3½												
BUSHING LINER				END CAP										
d Nom Dia	D*	L2	PART NO	d Nom Dia	A	B	PART NO							
1¾	2¼	2⅜	NRB-175	1¾	⅜	2	RC-175							
2	2½	2⅝	NRB-200	2	⅜	2¼	RC-200							
2½	3	3⅝	NRB-250	2½	½	2¾	RC-250							

- .015 grind stock left on this diameter for grinding to fit bored hole in die shoe.





## **ADDITIONAL SERVICES AVAILABLE TO SERVE THE TOOL INDUSTRY**

Complete capabilities to  
manufacture Plain Bearing and  
Ball Bearing Die Sets from  
mild steel, or aluminum,  
in any style or shape.

*Photograph  
below are  
aluminum  
die sets.*



---

## NORTH AMERICAN LOCATIONS

### CANADA

Windsor (519) 966-4431	Toronto (905) 274-3448	Cambridge (519) 740-3060	Montreal (514) 525-5560
---------------------------	---------------------------	-----------------------------	----------------------------

### U.S.A.

Madison Heights, MI	Cincinnati, Ohio 1-800-543-3790	Cleveland, Ohio	Nashville, TN
	Cheshire, Conn. 1-800-950-3999	Grand Rapids, MI 1-888-526-2467	

---

## EUROPEAN LOCATIONS (EOC Normalien Group)

### GERMANY

Lüdenscheid	Mahlberg	Grüna bei Chemnitz
-------------	----------	--------------------

