



BALL BEARING COMPONENTS "L" STYLE

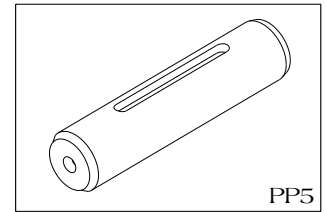


Note: MDL "L" Style Ball Bearing Components are designed to be interchangeable with ball bearing components from "Lamina" of the same size and type.

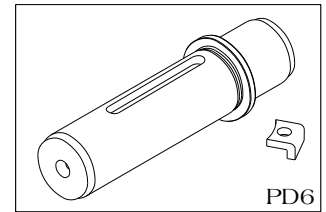
"Lamina" is a registered trademark of Anchor/Lamina America Inc.. MDL Mold & Die Components, Inc. is not connected, in any way, to Lamina, or Anchor/Lamina America Inc..



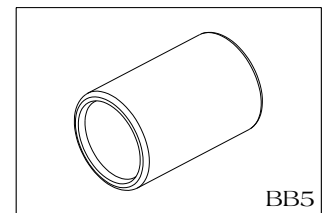
L Style Straight Ball Bearing Guide Post 4 - 5



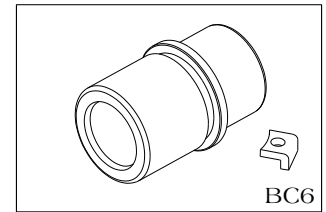
L Style Demountable Ball Bearing Guide Post 6 - 7



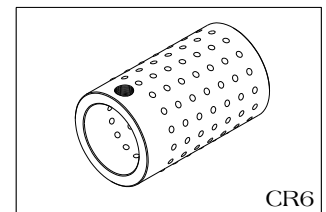
L Style Straight Sleeve Ball Bearing Bushings 8 - 9



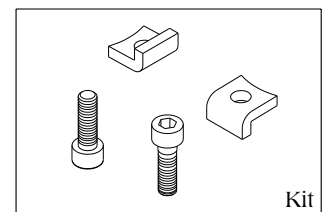
L Style Demountable Ball Bearing Bushings 10 - 11



L Style Ball Bearing Cages 12

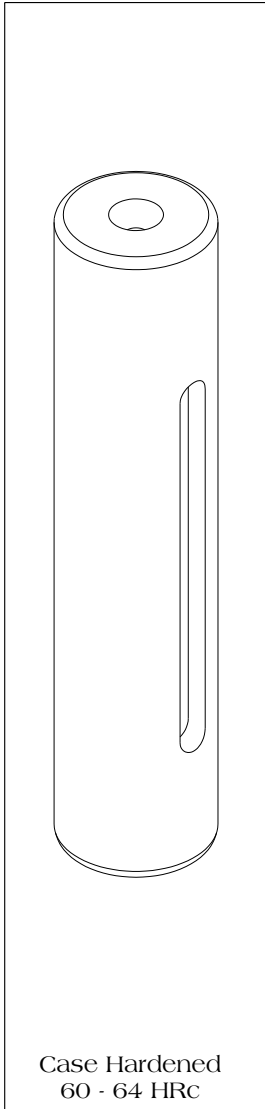


L Style Assembly Kits..... 13

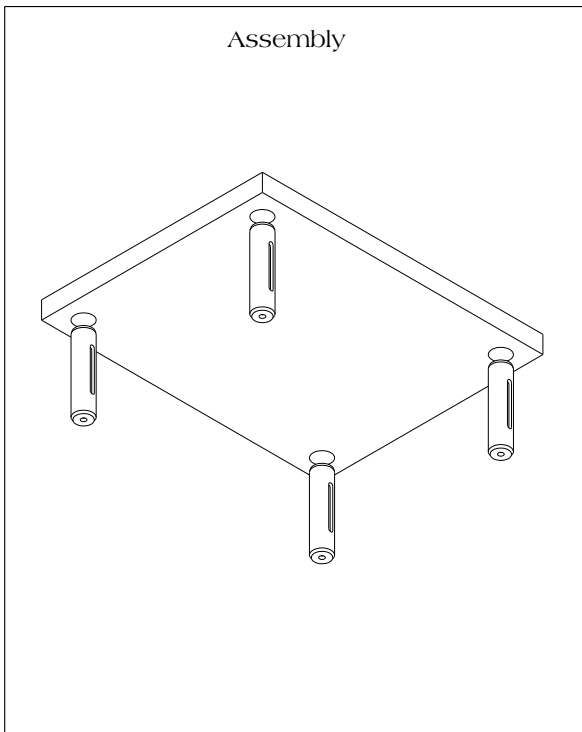
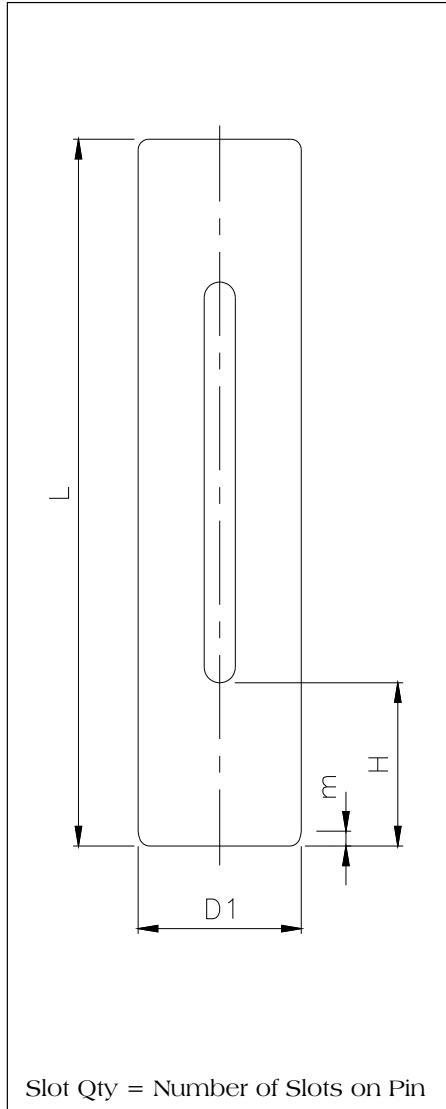
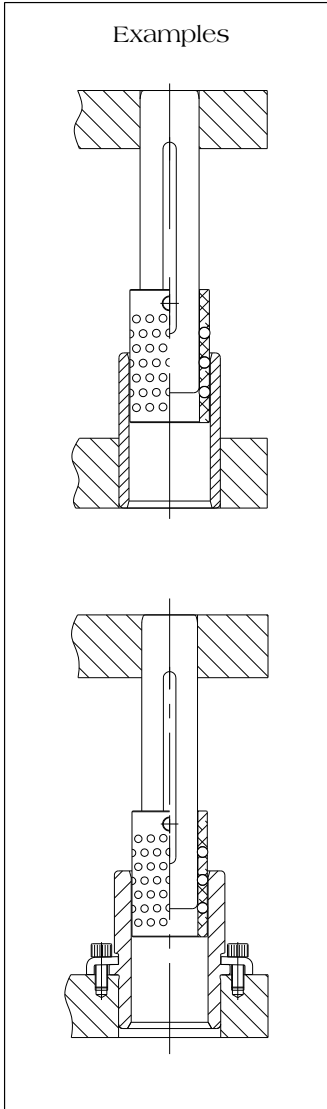
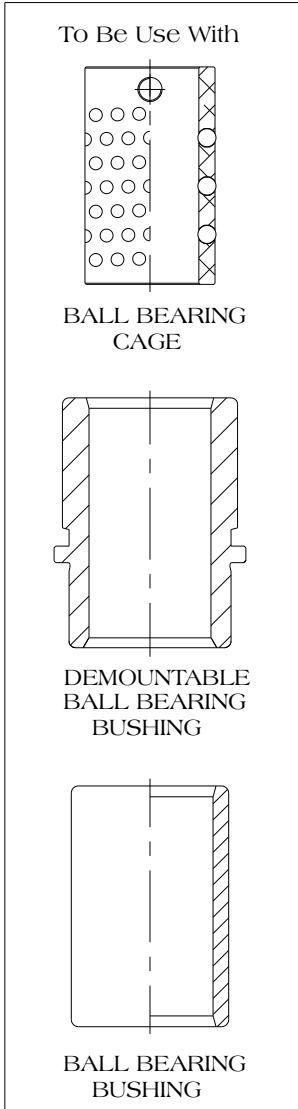


L Style Bore Sizes..... 14

L Style Selection Data..... 15



Case Hardened
60 - 64 HRC



All MDL L Style Straight Ball Bearing Guide Posts are marked at one end with: CAGE END. This is the working end of the Guide Post. The opposite end should be pressed into the Punch Holder.

MDL recommends that Straight Ball Bearing Guide Posts should be pressed at least 1.5 x its nominal Diameter (D1) into Punch Holder. Never less than 1.0 x Diameter.

The length of slot for MDL L Style Straight Ball Bearing Guide Posts is available upon request .

Bore size see page 14 . To select length see page 15, or consult " Part Selector " at www.mdlcomponents.com .

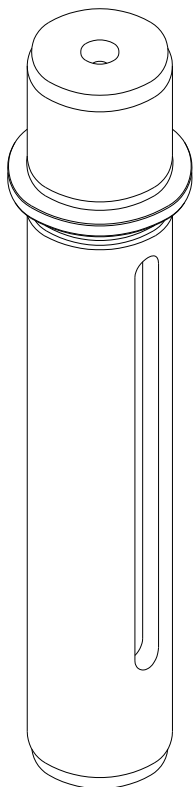
Note: Lempco slot location is different from slot location in MDL "L" Style guide post.



L Style Straight Ball Bearing Guide Post

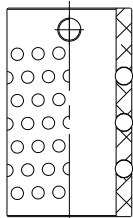
PP5.DDD.LLL

D _i	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
L	CATALOG NUMBER						
3.625	PP5.008.015						
3.875	PP5.008.016						
4.125	PP5.008.017						
4.375	PP5.008.018	PP5.010.018	PP5.012.018				
4.625	PP5.008.019	PP5.010.019	PP5.012.019				
4.875	PP5.008.020	PP5.010.020	PP5.012.020	PP5.014.020			
5.125	PP5.008.021	PP5.010.021	PP5.012.021	PP5.014.021			
5.375	PP5.008.022	PP5.010.022	PP5.012.022	PP5.014.022	PP5.016.022		
5.625	PP5.008.023	PP5.010.023	PP5.012.023	PP5.014.023	PP5.016.023		
5.875	PP5.008.024	PP5.010.024	PP5.012.024	PP5.014.024	PP5.016.024		
6.125				PP5.014.025	PP5.016.025		
6.375	PP5.008.026	PP5.010.026	PP5.012.026	PP5.014.026	PP5.016.026		
6.625					PP5.016.027		
6.875	PP5.008.028	PP5.010.028	PP5.012.028	PP5.014.028	PP5.016.028		
7.125					PP5.016.029		
7.375	PP5.008.030	PP5.010.030	PP5.012.030	PP5.014.030	PP5.016.030		
7.625					PP5.016.031		
7.875	PP5.008.032	PP5.010.032	PP5.012.032	PP5.014.032	PP5.016.032	PP5.020.032	PP5.024.032
8.375	PP5.008.034	PP5.010.034	PP5.012.034	PP5.014.034	PP5.016.034	PP5.020.034	PP5.024.034
8.875	PP5.008.036	PP5.010.036	PP5.012.036	PP5.014.036	PP5.016.036	PP5.020.036	PP5.024.036
9.375			PP5.012.038	PP5.014.038	PP5.016.038		
9.875		PP5.010.040	PP5.012.040	PP5.014.040	PP5.016.040	PP5.020.040	PP5.024.040
10.375			PP5.012.042	PP5.014.042	PP5.016.042		
10.875		PP5.010.044	PP5.012.044	PP5.014.044	PP5.016.044	PP5.020.044	PP5.024.044
11.375			PP5.012.046	PP5.014.046	PP5.016.046		
11.875		PP5.010.048	PP5.012.048	PP5.014.048	PP5.016.048	PP5.020.048	PP5.024.048
12.375			PP5.012.050	PP5.014.050	PP5.016.050		
12.875			PP5.012.052	PP5.014.052	PP5.016.052	PP5.020.052	PP5.024.052
13.875			PP5.012.056	PP5.014.056	PP5.016.056	PP5.020.056	PP5.024.056
14.875				PP5.014.060	PP5.016.060		
15.875					PP5.016.064		
16.875				PP5.014.068	PP5.016.068	PP5.020.068	PP5.024.068
17.875					PP5.016.072		
19.875						PP5.020.080	PP5.024.080
H	0.875	1.000	1.250	1.312	1.375	1.625	1.875
H	-	1.125	1.375	1.500	1.750	2.375	2.875
H	-	-	1.625	1.625	1.875	2.625	-
m	0.090	0.125	0.186		0.250		
Slot Qty	1				2		

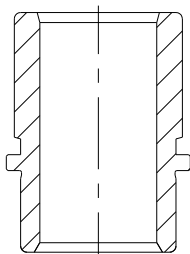


Case Hardened
60 - 64 HRC

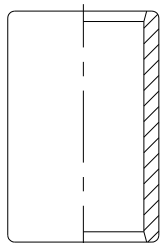
To Be Use With



BALL BEARING
CAGE

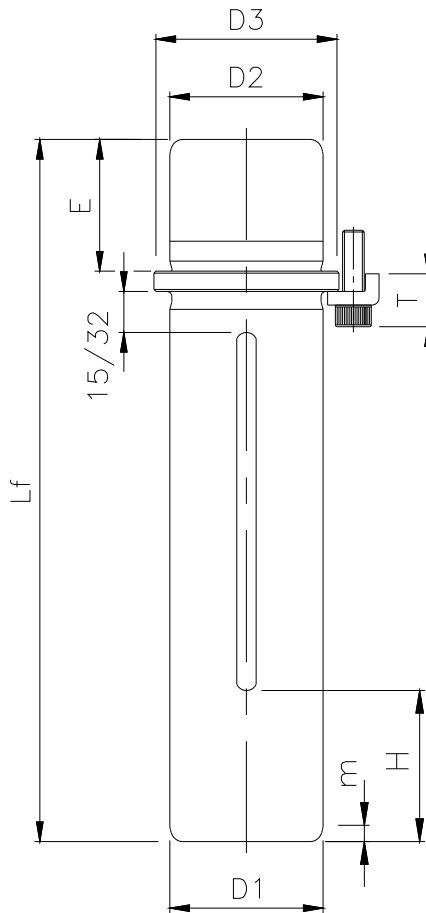
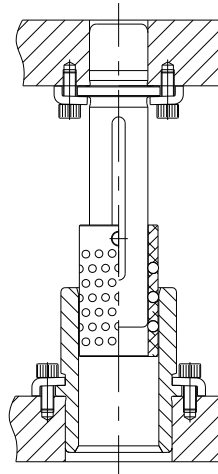
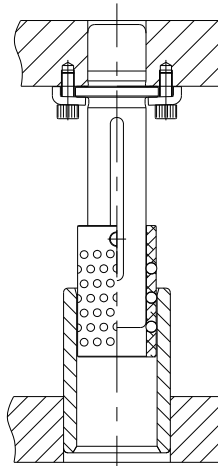


DEMOUNTABLE
BALL BEARING
BUSHING



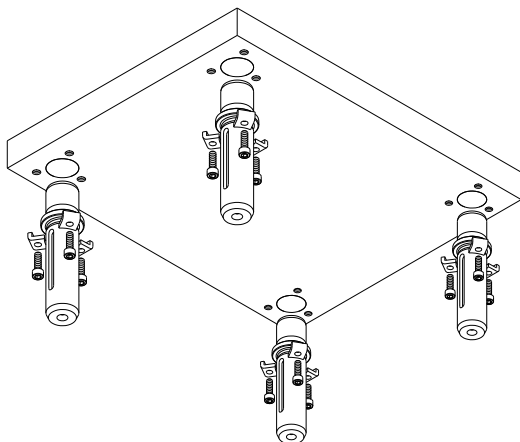
BALL BEARING
BUSHING

Examples

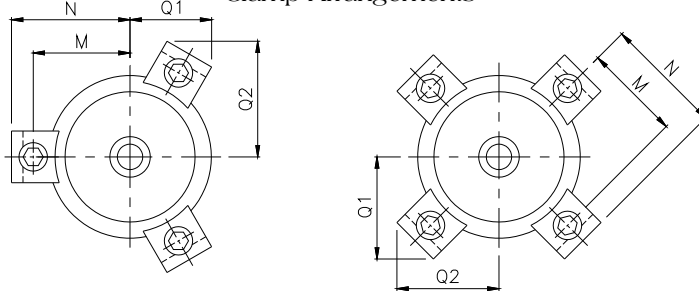


Slot Qty = Number of Slots on Pin

Assembly



Clamp Arrangements



Instructions

The length of slot for MDL L Style Demountable Ball Bearing Guide Posts is available upon request .

Bore size see page 14 . To select length see page 15 or consult " Part Selector " at www.mdlcomponents.com .

Obs: Ball Bearing cage will hit cap screw head before dog type screw of the Cage hits end of groove.

Note: Lempcos slot location is different from slot location in MDL " L " Style demountable guide post.

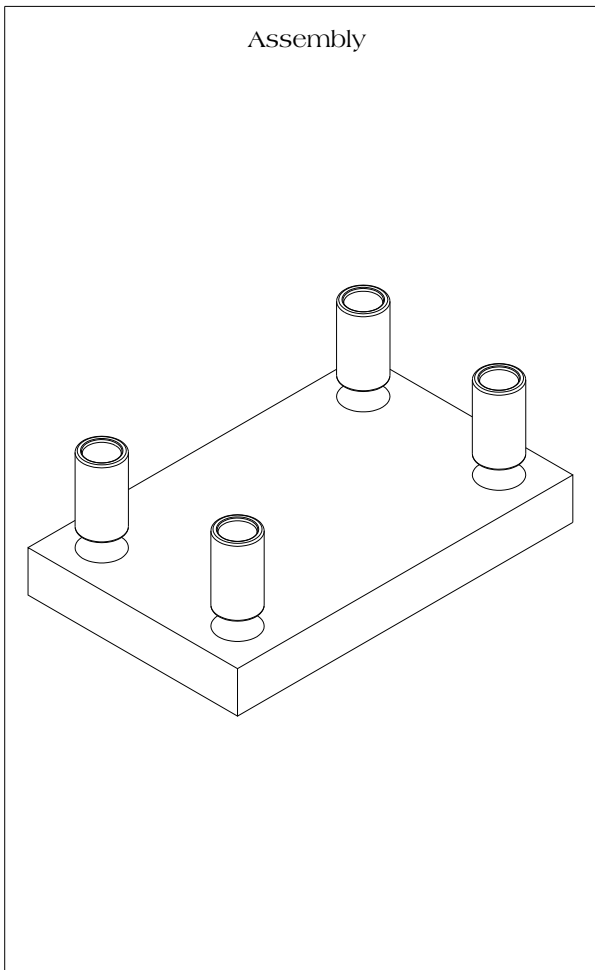
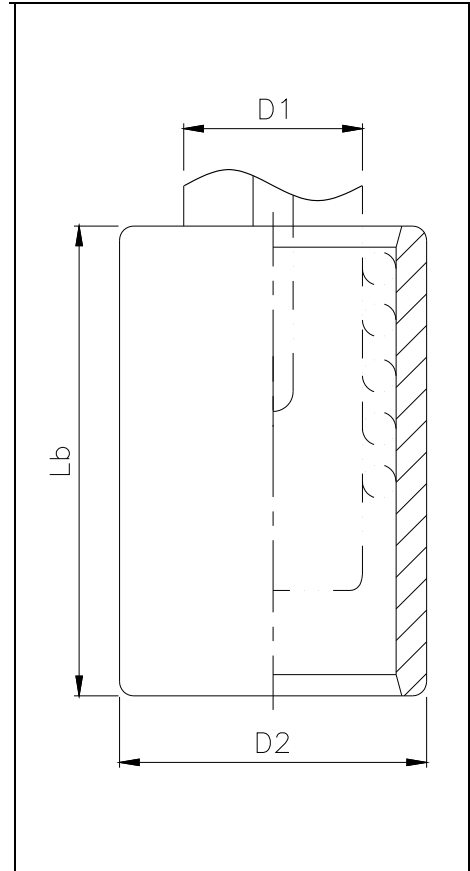
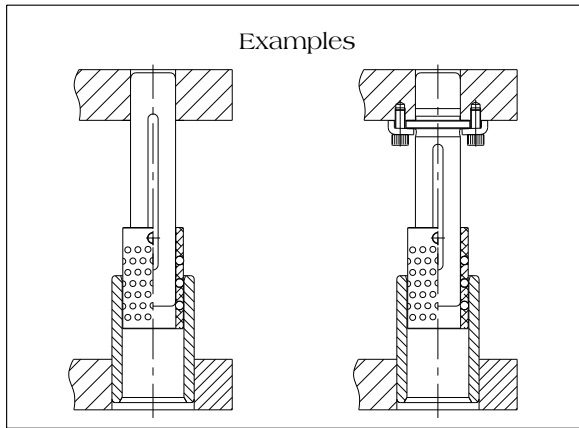
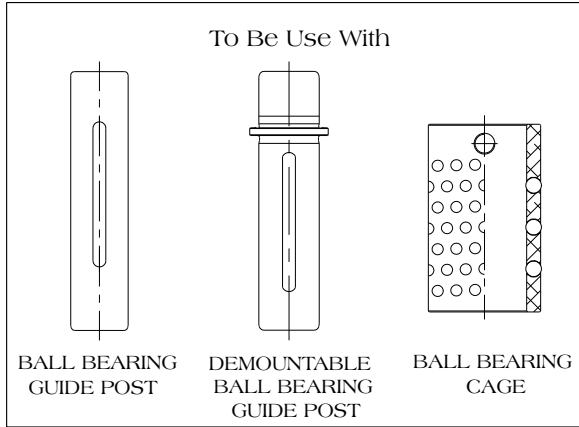
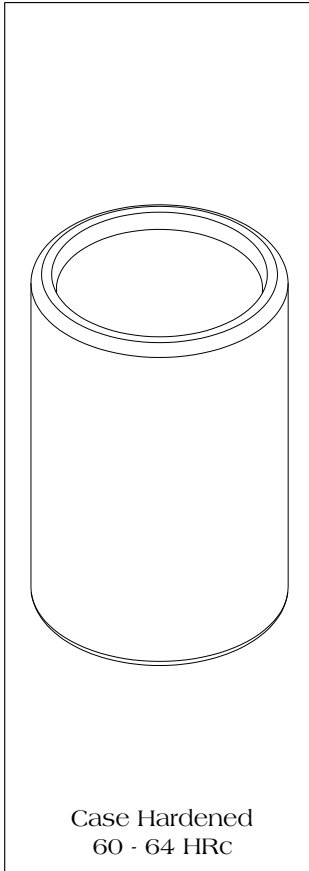


L Style Demountable Ball Bearing Guide Post

PD6.DDD.LfLfLf

D ₁ = D ₂	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
Lf	CATALOG NUMBER						
3.625	PD6.008.015						
4.375			PD6.012.018				
4.625	PD6.008.019						
4.875	PD6.008.020						
5.125	PD6.008.021	PD6.010.021					
5.375		PD6.010.022	PD6.012.022				
5.625		PD6.010.023	PD6.012.023				
5.875	PD6.008.024		PD6.012.024	PD6.014.024			
6.375	PD6.008.026	PD6.010.026	PD6.012.026		PD6.016.026		
6.625					PD6.016.027		
6.875	PD6.008.028	PD6.010.028	PD6.012.028	PD6.014.028	PD6.016.028		
7.125					PD6.016.029		
7.375	PD6.008.030	PD6.010.030	PD6.012.030	PD6.014.030	PD6.016.030		
7.875		PD6.010.032		PD6.014.032	PD6.016.032	PD6.020.032	PD6.024.032
8.375		PD6.010.034	PD6.012.034	PD6.014.034	PD6.016.034	PD6.020.034	PD6.024.034
8.875	PD6.008.036	PD6.010.036	PD6.012.036	PD6.014.036	PD6.016.036	PD6.020.036	PD6.024.036
9.375			PD6.012.038	PD6.014.038	PD6.016.038		
9.875				PD6.014.040	PD6.016.040	PD6.020.040	PD6.024.040
10.375			PD6.012.042	PD6.014.042	PD6.016.042		
10.875					PD6.016.044	PD6.020.044	PD6.024.044
11.875				PD6.014.048	PD6.016.048	PD6.020.048	PD6.024.048
12.375					PD6.016.050		
12.875					PD6.016.052	PD6.020.052	PD6.024.052
13.875					PD6.016.056	PD6.020.056	PD6.024.056
14.875					PD6.016.060		
15.875					PD6.016.064		
16.875					PD6.016.068	PD6.020.068	PD6.024.068
17.875					PD6.016.072		
19.875						PD6.020.080	PD6.024.080
H	0.875	0.875	1.125	1.375	1.375	2.375	1.875
H	-	1.125	1.375	1.625	1.625	-	2.375
H	-	-	-	-	1.875	-	2.875
Slot Qty	1				2		
D3	1.312	1.562	1.875	2.205	2.500	2.953	3.500
E	1.188		1.438	1.688	1.938		2.438
m	0.090	0.125	0.186		0.250		
M	0.875	1.000	1.125	1.312	1.437	1.687	1.937
N	1.280	1.405	1.530	1.718	1.843	2.093	2.343
Q ₁	0.911	0.973	1.036	1.436	1.524	1.701	1.878
Q ₂	1.265	1.373	1.481				
T	0.708						
Assy Kit	B01.008.000I3			B01.008.000I4			

to easy Kit detail see page 13.



MDL L Style Straight Sleeve Ball Bearing Bushings should not be press-fit since close-in may occur. If properly installed, no honing is necessary.

MDL recommends that L Style Straight Sleeve Ball Bearing Bushings should be installed using Loctite 603.

Bore Size see page 14. For selection of appropriate Ball Bearing Bushing length, see page 15, or consult " Part Selector " at www.mdlcomponents.com .

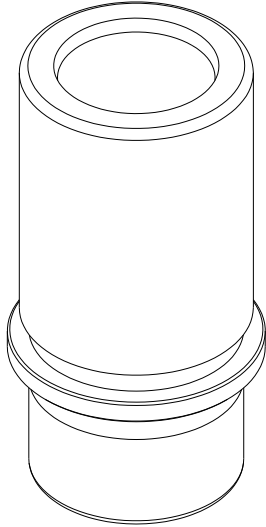
- Assembly Instructions:
1. Press Guide Posts into Punch Holder Plate. End of Guide Posts marked CAGE END should not be pressed in.
 2. Be sure Guide Posts are perpendicular to the surface of the Punch Holder (0.001 in 6 inches).
 3. Mount Ball Bearing Cages on the Guide Posts.
 4. Place Die Shoe on a flat surface. For Big Die Sets we recommend using two horses to keep the bores accessible on both ends.
 5. Place on Die Shoe two parallels having height as close as possible minimum Shut Height.
 6. Degrease Sleeve and Die Shoe Bore using appropriate solvent and wipe carefully.
 7. Apply a thin layer of a Loctite 603 on the Bores and Sleeves.
 8. Position the Sleeve into Bore.
 9. Bring the Punch Holder into position until it rests on the two parallels.
 10. Check that the Sleeves are in the right position.
 11. Allow the required time to harden: 4 hours at 72° F. Do not use Die Set during hardening process.



L Style Straight Sleeve Ball Bearing Bushings

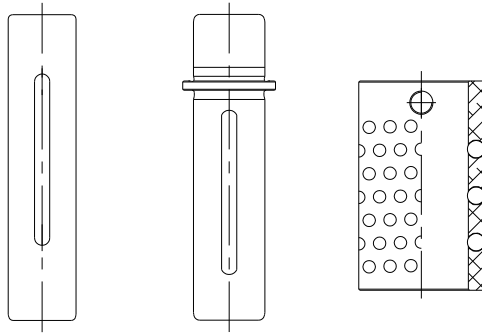
BB5.DDD.LbLbLb

D ₁	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
Lb	CATALOG NUMBER						
1.875	BB5.008.008						
2.125	BB5.008.009						
2.375	BB5.008.010	BB5.010.010					
2.625	BB5.008.011	BB5.010.011					
2.875	BB5.008.012	BB5.010.012	BB5.012.012	BB5.014.012	BB5.016.012		
3.125	BB5.008.013	BB5.010.013	BB5.012.013				
3.375	BB5.008.014	BB5.010.014	BB5.012.014	BB5.014.014	BB5.016.014		
3.625	BB5.008.015	BB5.010.015	BB5.012.015	BB5.014.015	BB5.016.015		
3.875	BB5.008.016	BB5.010.016	BB5.012.016	BB5.014.016	BB5.016.016		
4.125	BB5.008.017	BB5.010.017	BB5.012.017	BB5.014.017	BB5.016.017		
4.375	BB5.008.018	BB5.010.018	BB5.012.018	BB5.014.018	BB5.016.018		
4.625	BB5.008.019	BB5.010.019	BB5.012.019	BB5.014.019	BB5.016.019		
4.875	BB5.008.020	BB5.010.020	BB5.012.020	BB5.014.020	BB5.016.020		
5.125			BB5.012.021	BB5.014.021	BB5.016.021		
5.375	BB5.008.022	BB5.010.022	BB5.012.022	BB5.014.022	BB5.016.022		
5.875	BB5.008.024	BB5.010.024	BB5.012.024	BB5.014.024	BB5.016.024	BB5.020.024	BB5.024.024
6.375	BB5.008.026	BB5.010.026	BB5.012.026	BB5.014.026	BB5.016.026	BB5.020.026	BB5.024.026
6.875	BB5.008.028	BB5.010.028	BB5.012.028	BB5.014.028	BB5.016.028	BB5.020.028	BB5.024.028
7.375			BB5.012.030	BB5.014.030	BB5.016.030	BB5.020.030	BB5.024.030
7.875		BB5.010.032	BB5.012.032	BB5.014.032	BB5.016.032	BB5.020.032	BB5.024.032
8.375			BB5.012.034	BB5.014.034	BB5.016.034	BB5.020.034	BB5.024.034
8.875		BB5.010.036	BB5.012.036	BB5.014.036	BB5.016.036	BB5.020.036	BB5.024.036
9.375				BB5.014.038	BB5.016.038	BB5.020.038	BB5.024.038
9.875			BB5.012.040	BB5.014.040	BB5.016.040	BB5.020.040	BB5.024.040
10.375			BB5.012.042	BB5.014.042	BB5.016.042	BB5.020.042	BB5.024.042
10.875			BB5.012.044	BB5.014.044	BB5.016.044	BB5.020.044	BB5.024.044
11.875			BB5.012.048	BB5.014.048	BB5.016.048	BB5.020.048	BB5.024.048
12.875				BB5.014.052	BB5.016.052	BB5.020.052	BB5.024.052
13.875					BB5.016.056	BB5.020.056	BB5.024.056
D ₂	1.717	2.107	2.437	2.747	3.162	3.682	4.182



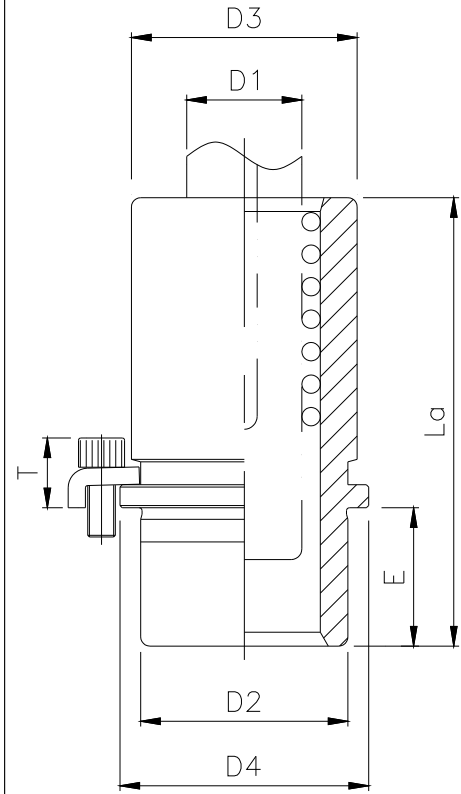
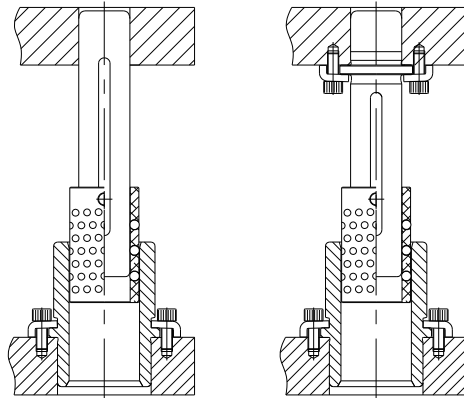
Case Hardened
60 - 64 HRC

To Be Use With

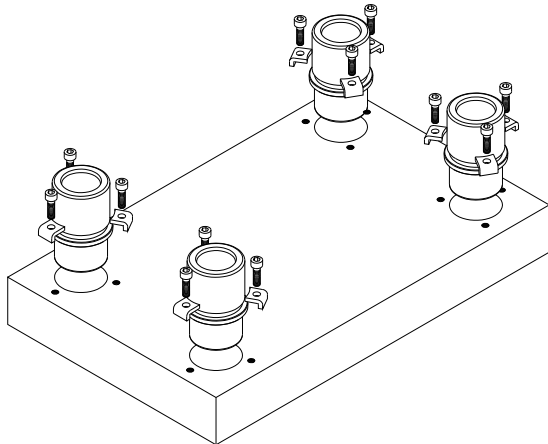


BALL BEARING GUIDE POST DEMOUNTABLE BALL BEARING GUIDE POST BALL BEARING CAGE

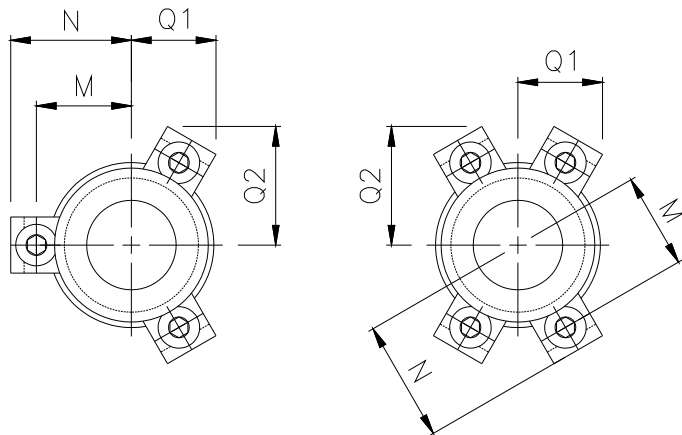
Examples



Assembly



Clamp Arrangements



MDL L Style Demountable Ball Bearing Bushings should not be press-fit since close-in may occur. If properly installed, no honing is necessary.

Bore Size see page 14. For selection of appropriate Ball Bearing Bushing length, see page 15, or consult " Part Selector " at www.mdlcomponents.com .

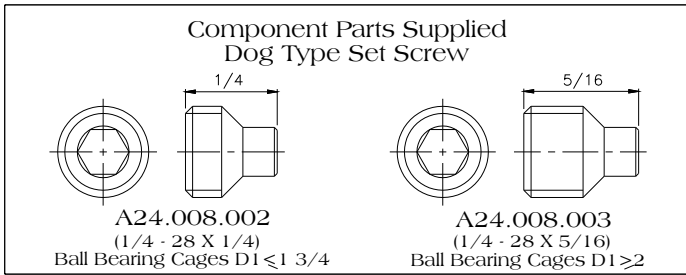
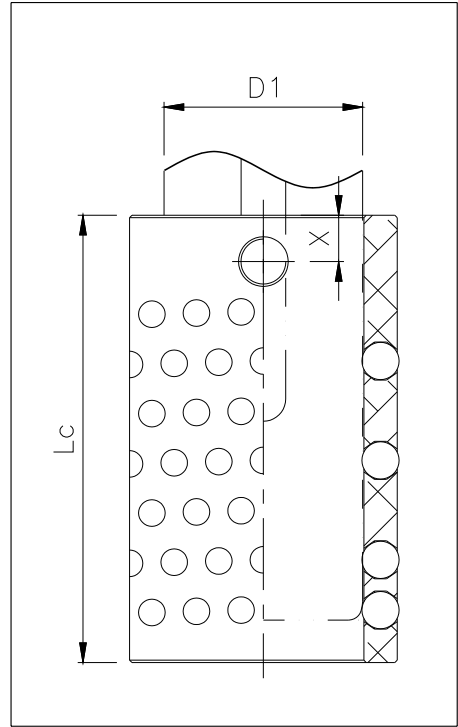
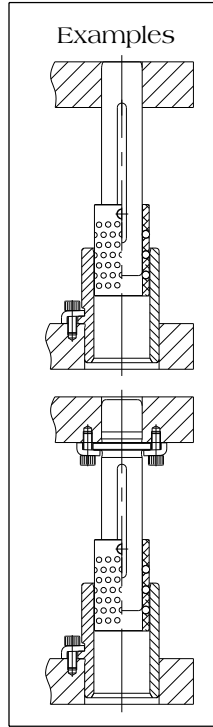
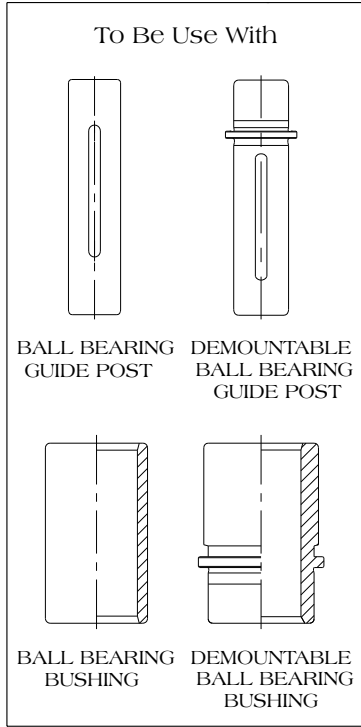
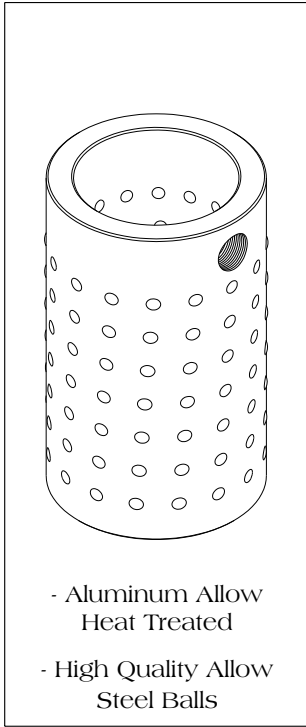


L Style Demountable Ball Bearing Bushings

BC6.DDD.LaLaLa

D ₁	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
La	CATALOG NUMBER						
1.875	BC6.008.008						
2.125	BC6.008.009						
2.375		BC6.010.010					
2.625	BC6.008.011	BC6.010.011					
2.875	BC6.008.012	BC6.010.012	BC6.012.012	BC6.014.012	BC6.016.012		
3.125	BC6.008.013	BC6.010.013	BC6.012.013				
3.375	BC6.008.014	BC6.010.014	BC6.012.014	BC6.014.014	BC6.016.014		
3.625	BC6.008.015	BC6.010.015	BC6.012.015		BC6.016.015		
3.875		BC6.010.016	BC6.012.016	BC6.014.016	BC6.016.016		
4.125		BC6.010.017	BC6.012.017	BC6.014.017	BC6.016.017		
4.375		BC6.010.018	BC6.012.018	BC6.014.018	BC6.016.018		
4.625			BC6.012.019	BC6.014.019	BC6.016.019		
4.875		BC6.010.020	BC6.012.020	BC6.014.020	BC6.016.020	BC6.020.020	BC6.024.020
5.125				BC6.014.021	BC6.016.021		
5.375		BC6.010.022	BC6.012.022	BC6.014.022	BC6.016.022	BC6.020.022	BC6.024.022
5.875		BC6.010.024	BC6.012.024	BC6.014.024	BC6.016.024	BC6.020.024	BC6.024.024
6.375				BC6.014.026	BC6.016.026	BC6.020.026	BC6.024.026
6.875				BC6.014.028	BC6.016.028	BC6.020.028	BC6.024.028
7.375				BC6.014.030	BC6.016.030	BC6.020.030	BC6.024.030
D ₂	1.7173	2.1073	2.4373	2.7473	3.1623	3.6823	4.1823
D ₃	1.883	2.238	2.550	2.863	3.425	3.925	4.425
D ₄	1.995	2.355	2.675	2.995	3.565	4.075	4.575
E	1.00		1.25				
M	1.219	1.406	1.562	1.719	2.000	2.250	2.500
N	1.624	1.812	1.968	2.124	2.405	2.655	2.905
Q ₁	1.083	1.177	1.385	1.474	1.638	1.779	1.922
Q ₂	1.563	1.725	1.791	1.919	2.153	2.358	2.563
T	0.708						
Assy Kit	B01.008.000I3		B01.008.000I4				

to easy Kit detail see page 13.



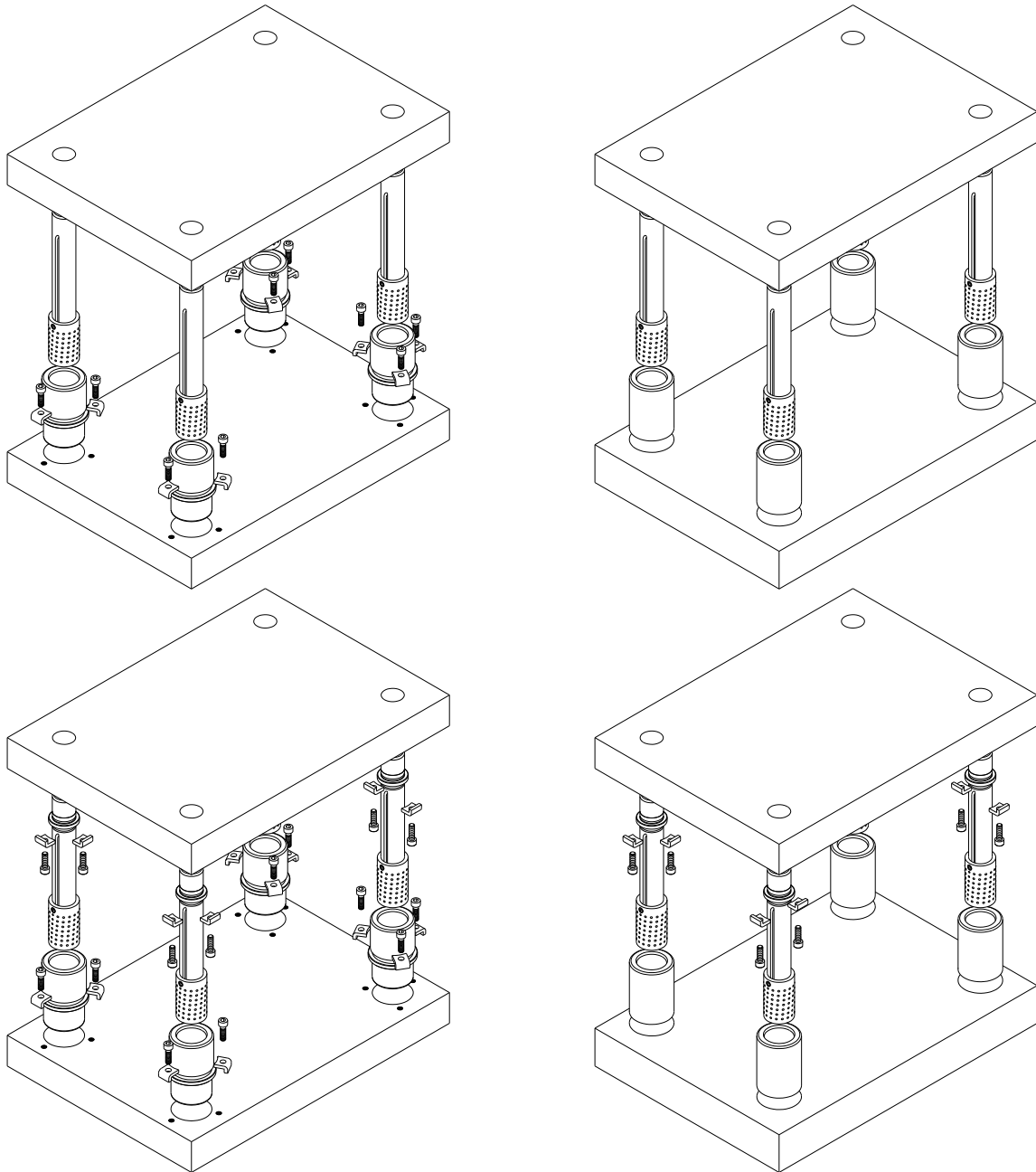
Assembly Instructions:

MDL L Style Ball Bearing Cages should always be assembly at the end of the Guide Post Marked: CAGE END.

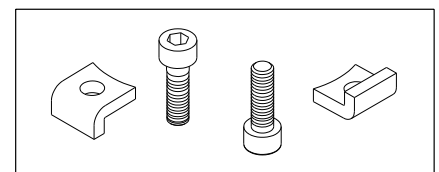
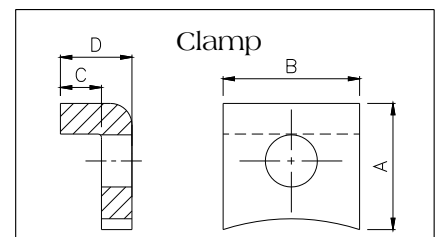
When tightening the Screw on the Ball Bearing Cages, Screw should not be over tightened to disrupt the free movement of the Ball Bearing Cage.

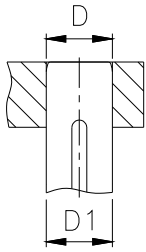
D1	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
Lc	CATALOG NUMBER						
1.50	CR6.008.006						
1.75	CR6.008.007						
2.00	CR6.008.008	CR6.010.008					
2.25	CR6.008.009	CR6.010.009					
2.50	CR6.008.010	CR6.010.010	CR6.012.010				
2.75		CR6.010.011	CR6.012.011	CR6.014.011			
3.00		CR6.010.012	CR6.012.012	CR6.014.012			
3.25		CR6.010.013	CR6.012.013	CR6.014.013	CR6.016.013		
3.50			CR6.012.014	CR6.014.014	CR6.016.014		
3.75			CR6.012.015	CR6.014.015	CR6.016.015		
4.00				CR6.014.016	CR6.016.016		
4.25				CR6.014.017	CR6.016.017		
4.50					CR6.016.018		
5.00						CR6.020.020	CR6.024.020
5.50						CR6.020.022	
6.00						CR6.020.024	CR6.024.024
6.50						CR6.020.026	
7.00						CR6.020.028	CR6.024.028
X	1/4				5/16		
Screw	A24.008.002				A24.008.003		
Qty	1				2		

Assembly Options for MDL L Style Ball Bearing



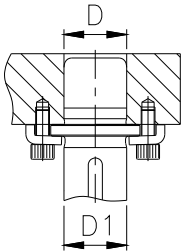
KIT NUMBER	B01.008.00013	B01.008.00014
Components Parts Supplied		
Clamp	B01.008.000	
Screw	A25.010.006 (5/16"-18 x 3/4")	
Qty	3	4
A	0.779	
B	0.625	
C	0.192	
D	0.374	





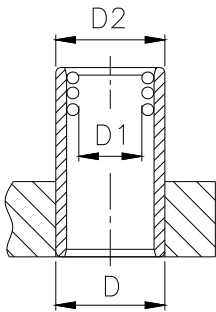
L STYLE STRAIGHT BALL BEARING GUIDE POST PP5

D ₁	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
D	$\frac{1.0015}{1.0010}$	$\frac{1.2515}{1.2510}$	$\frac{1.5015}{1.5010}$	$\frac{1.7515}{1.7510}$	$\frac{2.0015}{2.0010}$	$\frac{2.5015}{2.5010}$	$\frac{3.0015}{3.0010}$



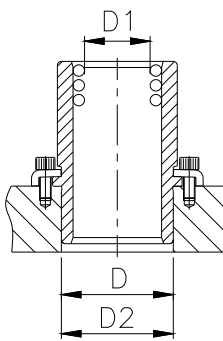
L STYLE DEMOUNTABLE BALL BEARING GUIDE POST PD6

D ₁	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
D	$\frac{1.0016}{1.0011}$	$\frac{1.2516}{1.2511}$	$\frac{1.5016}{1.5011}$	$\frac{1.7516}{1.7511}$	$\frac{2.0016}{2.0011}$	$\frac{2.5016}{2.5011}$	$\frac{3.0016}{3.0011}$



L STYLE STRAIGHT SLEEVE BALL BEARING BUSHINGS BB5

D ₁	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
D ₂	1.717	2.107	2.437	2.747	3.162	3.682	4.182
D	$\frac{1.7181}{1.7176}$	$\frac{2.1081}{2.1076}$	$\frac{2.4381}{2.4376}$	$\frac{2.7481}{2.7476}$	$\frac{3.1631}{3.1626}$	$\frac{3.6831}{3.6826}$	$\frac{4.1831}{4.1826}$



L STYLE DEMOUNTABLE BALL BEARING BUSHINGS BC6

D ₁	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3
D ₂	1.716	2.106	2.436	2.746	3.161	3.681	4.181
D	$\frac{1.7168}{1.7163}$	$\frac{2.1068}{2.1063}$	$\frac{2.4368}{2.4363}$	$\frac{2.7468}{2.7463}$	$\frac{3.1618}{3.1613}$	$\frac{3.6818}{3.6813}$	$\frac{4.1818}{4.1813}$

The Bores for MDL " L " Style Ball Bearing Components should be a precision bore, perpendicular to plates surfaces and smooth and free from tool marks to provide proper bearing area.

1- Straight Ball Bearing Guide Post Length: (L)

At Minimum Shut Height with Tool Life Depleted, Guide Post length (L) should allow at least 1/4 inch clearance (J) from the bottom. Select the next shorter Guide Post available in catalog. See page 5.
MDL recommends that Straight Ball Bearing Guide Posts should be pressed at least 1.5 x its nominal Diameter (D1) into Punch Holder. In no case should be pressed less than 1.0 x Diameter. It is not necessary to press Guide Post all the way to the top of C2.

2- Demountable Ball Bearing Guide Post Length: (Lf)

Guide Post length (Lf) is the minimum Shut Height with Tool Life Depleted (H) minus 1/4 inch clearance (J) from the bottom, minus the thickness of the punch holder (C2) plus (E) Dimension of Demountable Guide Post.
Select the next shorter Demountable Guide Post available in catalog. See page 7.

3- Straight Sleeve Ball Bearing Bushing Length: (Lb)

3.1 - With Straight Ball Bearing Guide Post: Maximum Straight Sleeve Ball Bearing Bushing length (Lb) is the Minimum Shut Height with Tool Life Depleted minus the thickness of the Punch Holder (C2) minus 1/4 inch. See page 9.
3.2 - With Demountable Ball Bearing Guide Post: Maximum Straight Sleeve Ball Bearing Bushing length (Lb) is the Minimum Shut Height with Tool Life Depleted minus the thickness of the Punch Holder (C2) minus assy Clamps (T) minus 1/4 inch. Select the next shorter Sleeve available in catalog. See page 9.

4- Demountable Ball Bearing Bushing Length: (La)

4.1 - With Straight Ball Bearing Guide Post: Maximum Demountable Ball Bearing Bushing length (La) is the Minimum Shut Height (H) With Tool Life Depleted minus the thickness of the Punch Holder (C2) minus die shoe (C1) plus (E) dimension of Bushing minus 1/4 inch. Select the next shorter Demountable Ball Bearing Bushing. See page 11.
4.2 - With Demountable Ball Bearing Guide Post: Maximum Demountable Ball Bearing Bushing length (La) is the Minimum Shut Height (H) with Tool Life Depleted minus the thickness of the Punch Holder (C2) minus die shoe (C1) minus assy Clamps (T) plus (E) dimension of Bushing minus 1/4 inch. Select the next shorter Bushing available in the catalog. See page 11.

5- Ball Bearing Cages Length: (Lc)

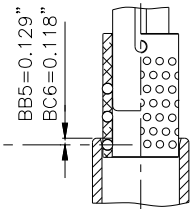
Maximum length for Ball Bearing Cages is the overall length (Lc) of the Ball Bearing Bushing length (Lb) minus 1/2 inch. Select the next shorter Ball Bearing Cage available in catalog. See page 12.

Note

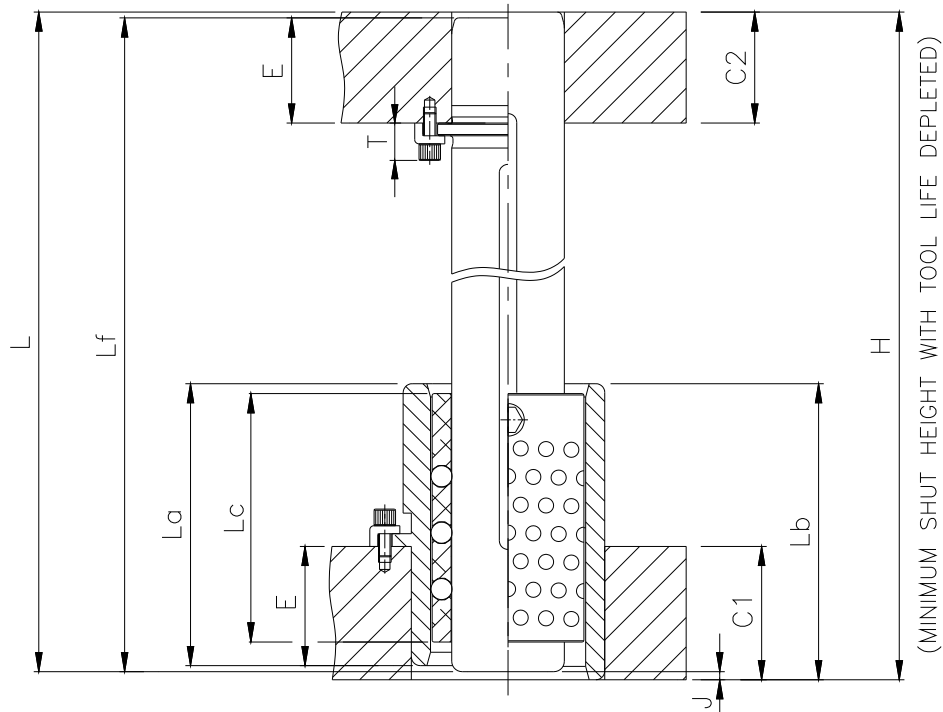
Longer Ball Bearing Bushings and Cages provide better guidance for Die Sets. Shorter Ball Bearing Bushings and Cages provide economical solutions for Die Sets.
Proper technical and economical consideration should be taken into account when making the selection of components.

PRE-LOAD LINE

Above this line
Balls are free.
PRE-LOAD LINE
Below this line
Balls are engaged and rolling.



Components





MDL - Brazil



MDL - France



MDL - Mexico



MDL - India



MDL - USA



MDL - Porter Besson, France



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