



BUSHINGS

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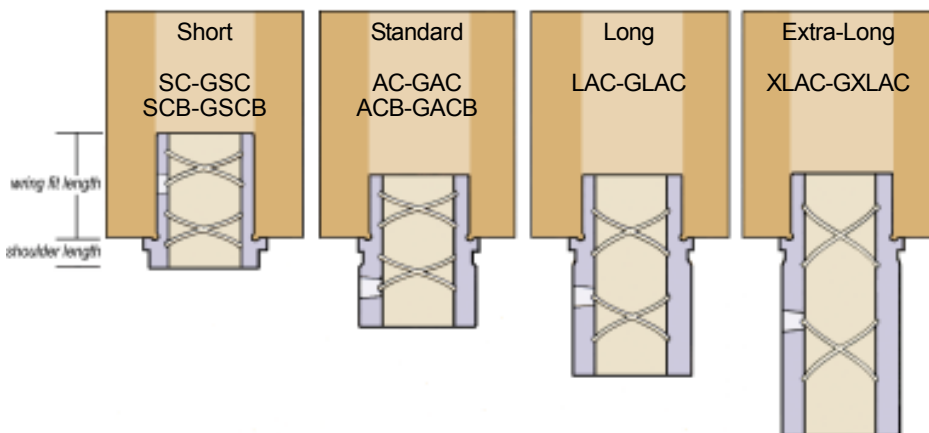
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SHOULDER BUSHING STYLES



All bronze plated shoulder bushings must be wring-fit in the die shoe. It is also recommended that Solid Bronze shoulder bushings be mounted similarly.

Bronze plated bushings feature figure 8 oil grooves for maximum lubrication. For long wear, bronze plated bushings should be lubricated with a high temperature, high pressure lithium grease on a regular basis.

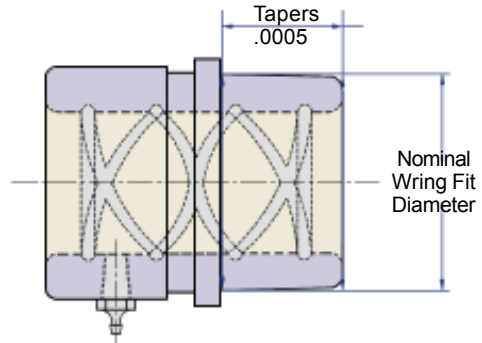
Self-lubricating bronze with graphite bushings require initial lubrication with light oil. Periodic lubrication will extend the life of self-lubricating bushings. **Do not use grease.**

Specials have become very important at Lamina. The table below will give a basic idea of our everyday manufacturing capabilities. If you have a need for special bushings, please send your requests for quotations. See page 22 for pin manufacturing capabilities.

BUSHING MANUFACTURING CAPABILITIES						
	Series Inch	Min. Length	Max. Length	Series Metric	Min. Length	Max. Length
	Straight & Shoulder	.750	1	2.0	32	25
1.000		1	3.0	40	25	150
1.250		1	6.0	50	25	350
1.500		1	6.0	63	25	350
1.750		1	10.0	80	25	350
2.000		1	14.0	100	25	350
2.500		1	14.0	125	25	350
3.000		1	14.0	•	•	•
Bronze Plated & Solid Steel	.625	1	2.0	•	•	•
	.750	1	3.0	19	25	100
	.875	1	4.0	•	•	•
	1.000	1	5.0	•	•	•
	1.250	1	7.0	•	•	•
	1.500	1	7.0	•	•	•
	1.750	1	7.0	40	25	150
	2.000	1	9.0	50	25	225
	2.500	1	9.0	63	25	225
	3.000	1	9.0	80	25	225
3.750	1	9.0	100	25	225	
4.500	1	9.0	125	25	225	
Solid Bronze	.5000	3.5	5.0	•	•	•
	.625	0.375	5.87	12.5	9	50
	.750	0.375	5.87	•	•	•
	.875	0.375	5.87	20	9	140
	1.000	0.375	5.87	•	•	•
	1.250	1	6.0	•	•	•
	1.500	1	6.0	•	•	•
	1.750	1	6.0	40	9	150
	2.000	1	6.0	•	•	•
	2.500	1.25	8.0	•	•	•
3.000	1.25	8.0	•	•	•	
3.750	2	16.0	•	•	•	
4.500	2	16.0	100	50	400	
Self-Lubricating	.625	0.375	3.5	12.50	9	50
	.750	0.875	6.0	19	9	140
	.875	0.875	6.0	20	9	140
	1.000	0.875	6.0	•	•	•
	1.250	0.875	6.0	•	•	•
	1.500	0.875	6.0	•	•	•
	1.750	0.875	6.0	•	•	•
	2.000	1.25	6.0	•	•	•
	2.500	1.25	8.0	63	25	200
	3.000	1.25	8.0	•	•	•
3.750	1.25	8.0	•	•	•	
4.500	1.25	8.0	125	50	200	

We are not restricted to the above parameters. Every quote will be analyzed for manufacturing possibility.

LAMINA DIE SET STANDARD GRIND (LDSS)



Slight taper on wring fit diameter facilitates installation. (This feature is standard on all bronze plated and solid steel shoulder bushings unless otherwise noted.) Bushings are held in place with toe clamps and screws unless otherwise noted.

In the following pages bronze plated and solid steel bushings which are listed as ground are "LDSS" ground.

GUIDE BUSHINGS

Class 1 & 2 bushing dimensions shown opposite are for use in precision die sets.

Class 3 bushings are for use with automotive, hardware, forming or draw dies where stamping stock is thicker than 1/16", and clearances between punch and die sections will be more than .003" per side.

■ Bronze-Plated Bushings Available in Class 1 or Class 2

■ Solid Bronze Bushings Available in Class 1 or Class 2

■ Hardened Steel Bushings available in Class 2

■ Self-Lubricating Bushings available in Class 3

D1 NOMINAL PIN DIAMETER	LAMINA BUSHINGS I.D. Dimensions		
	Class 1	Class 2	Class 3
3/4	.7503	.7506	.7510
	.7502	.7503	.7506
7/8	.8753	.8756	.8760
	.8752	.8753	.8756
1	1.0003	1.0006	1.0010
	1.0002	1.0003	1.0006
1-1/4	1.2503	1.2506	1.2510
	1.2502	1.2503	1.2506
1-1/2	1.5003	1.5006	1.5010
	1.5002	1.5003	1.5006
1-3/4	1.7503	1.7506	1.7512
	1.7502	1.7503	1.7507
2	2.0003	2.0007	2.0012
	2.0002	2.0003	2.0007
2-1/2	2.5006	2.5012	2.5018
	2.5004	2.5006	2.5012
3	3.0008	3.0014	3.0023
	3.0006	3.0008	3.0014
3-3/4	—	3.7518	3.7528
	—	3.7510	3.7518
4-1/2	—	4.5025	4.5035
	—	4.5015	4.5025

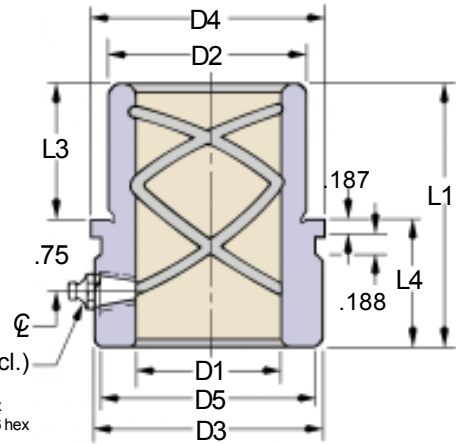
Bushings – Inch – Wring Fit Style



BRONZE PLATED



SOLID STEEL



Grease Fitting (incl.)
Grease Fittings
Ø3/4" - 1/4-28 NTF, 5/16 hex
Ø7/8 - 3" - 1/8-27 NPTF, 7/16 hex

*See page 3 for details.

See pages 16 & 17 for toe clamp installation instructions.

D-Clamps & Screws are included with wring fit style bushings.

STANDARD SHOULDER BUSHINGS – BRONZE PLATED

PART NUMBER		PART NUMBER		D1 NOM PIN DIA	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOULDER OD	D5 HEAD OD GROOVE	L1 OVERALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 2*		Class 1*			GROUND	UNGROUND						
GROUND	UNGROUND	GROUND	UNGROUND									
GAC-750-S	AC-750-S	GAC7501S	AC7501S	3/4	1.1250	1.1410	1.219	1.313	1.125	2.063	.813	1.250
GAC-875-S	AC-875-S	GAC8751S	AC8751S	7/8	1.3750	1.3910	1.469	1.563	1.375	2.125	.875	1.250
GAC-100-S	AC-100-S	GAC1001S	AC1001S	1	1.5000	1.5160	1.656	1.750	1.563	2.125	.875	1.250
GAC-100-L	AC-100-L	GAC1001L	AC1001L							3.125	1.875	
GAC-125-S	AC-125-S	GAC1251S	AC1251S	1-1/4	1.7500	1.7660	2.031	2.125	1.938	2.625	1.125	1.500
GAC-125-L	AC-125-L	GAC1251L	AC1251L							3.625	2.125	
GAC-150-SP	N/A	N/A	N/A	1-1/2	2.0000	N/A	2.281	2.375	2.188	2.650	1.150	1.500
GAC-150-S	AC-150-S	GAC1501S	AC1501S			2.0160				2.875	1.375	
GAC-150-L	AC-150-L	GAC1501L	AC1501L			3.875				2.375		
GAC-175-SP	N/A	N/A	N/A	1-3/4	2.2500	N/A	2.531	2.625	2.438	2.875	1.375	1.500
GAC-175-S	AC-175-S	GAC1751S	AC1751S			2.2660				3.125	1.625	
GAC-175-L	AC-175-L	GAC1751L	AC1751L			4.125				2.625		
GAC-200-SP	N/A	N/A	N/A	2	2.5000	N/A	3.031	3.125	2.938	2.875	1.375	1.500
GAC-200-S	AC-200-S	GAC2001S	AC2001S			2.5160				3.375	1.875	
GAC-200-L	AC-200-L	GAC2001L	AC2001L			4.375				2.875		
GAC-250-S	AC-250-S	GAC2501S	AC2501S	2-1/2	3.0000	3.0160	3.531	3.625	3.438	3.875	1.875	2.000
GAC-300-S	AC-300-S	GAC3001S	AC3001S	3	3.6250	3.6410	4.281	4.375	4.188	3.875	1.875	2.000

STANDARD SHOULDER BUSHINGS – SOLID STEEL

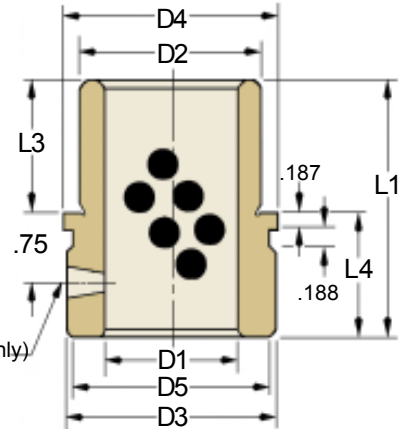
PART NUMBER		D1 NOMINAL PIN DIAMETER	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOULDER OD	D5 HEAD OD GROOVE	L1 OVERALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 2 only*			GROUND	UNGROUND						
GROUND	UNGROUND									
GAC-750-SS	AC-750-SS	3/4	1.1250	1.1410	1.219	1.313	1.125	2.063	.813	1.250
GAC-100-SS	AC-100-SS	1	1.5000	1.5160	1.656	1.750	1.563	2.125	.875	1.250
GAC-100-SS2	AC-100-SS2							2.875	.875	2.000
GAC-125-SS	AC-125-SS	1-1/4	1.7500	1.7660	2.031	2.125	1.938	2.625	1.125	1.500
GAC-125-SS2	AC-125-SS2							3.125	1.125	2.000
GAC-150-SS	AC-150-SS	1-1/2	2.0000	2.0160	2.281	2.375	2.188	2.875	1.375	1.500
GAC-150-SS2	AC-150-SS2							3.375	1.375	2.000
GAC-175-SS	AC-175-SS	1-3/4	2.2500	2.2660	2.531	2.625	2.438	3.125	1.625	1.500
GAC-175-SS2	AC-175-SS2							3.625	1.625	2.000
GAC-200-SS	AC-200-SS	2	2.5000	2.5160	3.031	3.125	2.938	3.375	1.875	1.500
GAC-200-SS2	AC-200-SS2							3.875	1.875	2.000
GAC-250-SS	AC-250-SS	2-1/2	3.0000	3.0160	3.531	3.625	3.438	3.875	1.875	2.000

Bushings – Inch – Wring Fit Style



SOLID BRONZE

SELF-LUBRICATING



Grease Fitting (Solid Bronze only)
Grease Fittings
Ø3/4 - 1/4-28 NTF, 5/16 hex
Ø7/8 - 1/8-27 NPTF, 7/16 hex

*See page 3 for details.

See pages 16 & 17 for toe clamp installation instructions.

D-Clamps & Screws are included with wring fit style bushings.

STANDARD SHOULDER BUSHINGS – SOLID BRONZE

PART NUMBER		PART NUMBER		D1 NOM PIN DIA	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOUL- DER OD	D5 HEAD OD GROOVE	L1 OVER- ALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 2*		Class 1*			GROUND	UNGROUND						
GROUND	UNGROUND	GROUND	UNGROUND									
GAC-750-SB	AC-750-SB	GAC7501SB	AC7501SB	3/4	1.1250	1.1410	1.219	1.313	1.125	2.063	.813	1.250
GAC-875-SB	AC-875-SB	GAC8751SB	AC8751SB	7/8	1.3750	1.3910	1.469	1.563	1.375	2.125	.875	1.250
GAC-100-SB	AC-100-SB	GAC1001SB	AC1001SB	1	1.5000	1.5160	1.656	1.750	1.563	2.125	.875	1.250
GAC-125-SB	AC-125-SB	GAC1251SB	AC1251SB	1-1/4	1.7500	1.7660	2.031	2.125	1.938	2.625	1.125	1.500
GAC-150-SB	AC-150-SB	GAC1501SB	AC1501SB	1-1/2	2.0000	2.0160	2.281	2.375	2.188	2.875	1.375	1.500
GAC-175-SB	AC-175-SB	GAC1751SB	AC1751SB	1-3/4	2.2500	2.2660	2.531	2.625	2.438	3.125	1.625	1.500
GAC-200-SB	AC-200-SB	GAC2001SB	AC2001SB	2	2.5000	2.5160	3.031	3.125	2.938	3.375	1.875	1.500
GAC-250-SB	AC-250-SB	GAC2501SB	AC2501SB	2-1/2	3.0000	3.0160	3.531	3.625	3.438	3.875	1.875	2.000
GAC-300-SB	AC-300-SB	GAC3001SB	AC3001SB	3	3.6250	3.6410	4.281	4.375	4.188	3.875	1.875	2.000

STANDARD SHOULDER BUSHINGS – SELF LUBRICATING

PART NUMBER		D1 NOMINAL PIN DIAMETER	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOULDER OD	D5 HEAD OD GROOVE	L1 OVERALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 3 only*			GROUND	UNGROUND						
GACB750S	ACB750S	3/4	1.1250	1.1410	1.219	1.313	1.125	2.063	.813	1.250
GACB100S	ACB100S	1	1.5000	1.5160	1.656	1.750	1.563	2.125	.875	1.250
GACB125S	ACB125S	1-1/4	1.7500	1.7660	2.031	2.125	1.938	2.625	1.125	1.500
GACB150S	ACB150S	1-1/2	2.0000	2.0160	2.281	2.375	2.188	2.875	1.375	1.500
GACB175S	ACB175S	1-3/4	2.2500	2.2660	2.531	2.625	2.438	3.125	1.625	1.500
GACB200S	ACB200S	2	2.5000	2.5160	3.031	3.125	2.938	3.375	1.875	1.500
GACB250S	ACB250S	2-1/2	3.0000	3.0160	3.531	3.625	3.438	3.875	1.875	2.000
GACB300S	ACB300S	3	3.6250	3.6410	4.281	4.375	4.188	3.875	1.875	2.000

Note: Self-lubricating bronze with graphite bushings require initial lubrication with light oil. Periodic lubrication will extend the life of self-lubricating bushings. **Do not use grease.**

All Standard Shoulder Bushings (unless otherwise noted) are to be wring fit and held in place with toe clamps and screws. This means that the bushing should be installed into the die shoe using a wringing (circular) motion with the heel of the hand. Please see bore size information on page 18.

Bushings – Inch – Pressed Fit Style

Press Fit Shoulder Bushings allow for fast, easy installation. Eliminates the use of clamps and screws.



BRONZE PLATED

Grease Fittings
 3/4 - 1/4-28 NTF, 5/16 hex
 7/8 - 1/8-27 NPTF, 7/16 hex

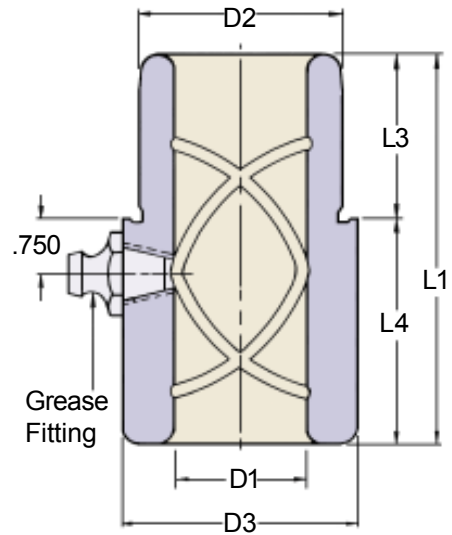


Figure 8 oil grooves allow the lubricant to flow smoothly throughout the bushing I.D.

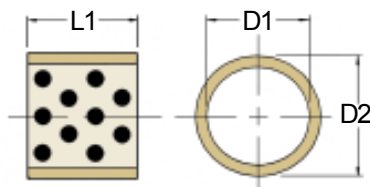
SHOULDER BUSHING – PRESS FIT								
PART NUMBER	NOMINAL PIN DIAMETER	D1*	D2 PRESS FIT DIAMETER	D3 HEAD O.D.	L1 OVERALL LENGTH	L4 HEAD LENGTH	L3 PRESS FIT LENGTH	Recommended Bore Size
8-1188-2500	1	$\frac{1.0006}{1.0003}$	$\frac{1.5023}{1.5018}$	1.688	2.500	1.313	1.188	$\frac{1.5005}{1.5000}$
10-1188-2688	1-1/4	$\frac{1.2506}{1.2503}$	$\frac{1.7523}{1.7518}$	1.938	2.688	1.500	1.188	$\frac{1.7505}{1.7500}$
12-1438-2938	1-1/2	$\frac{1.5007}{1.5004}$	$\frac{2.0023}{2.0018}$	2.188	2.938	1.500	1.438	$\frac{2.0005}{2.0000}$

***Please note!**

Press Fit bushings have tapered holes, larger at press fit end. This facilitates honing, since the bore will close up in a more nearly straight line when pressed in.

While these bushings are precision finished on the O.D. a small amount of stock is left on the I.D. to allow for honing because they are pressed fit type.

Toe clamps and screws are not provided with press fit shoulder bushings and they do not come with an LDSS grind.



BUSHINGS FOR LIFTER PINS – METRIC			
PART NUMBER	D1	D2	L1
MBL-704530	45	55	30
MBL-704540			40
MBL-704550			50

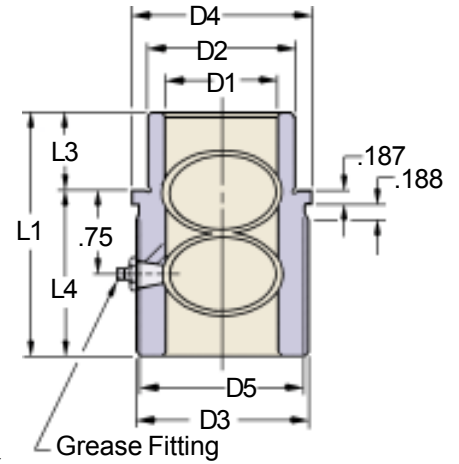
Bushings – Wring Fit Style



BRONZE PLATED



SOLID STEEL



*See page 3 for details.
 See pages 16 & 17 for toe clamp placement instructions.

LONG SHOULDER BUSHINGS – BRONZE PLATED												
PART NUMBER				D1 NOM PIN DIA	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOUL- DER OD	D5 HEAD OD GROOVE	L1 OVER- ALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 2*		Class 1*			GROUND	UNGROUND						
GROUND	UNGROUND	GROUND	UNGROUND									
GLAC-750-S	LAC-750-S	GLAC7501S	LAC7501S	3/4	1.1250	1.1410	1.219	1.313	1.125	2.813	.813	2.000
GLAC-875-S	LAC-875-S	GLAC8751S	LAC8751S	7/8	1.3750	1.3910	1.469	1.563	1.375	3.000	.875	2.125
GLAC-100-S	LAC-100-S	GLAC1001S	LAC1001S	1	1.5000	1.5160	1.656	1.750	1.563	3.125	.875	2.250
GLAC-125-S	LAC-125-S	GLAC1251S	LAC1251S	1-1/4	1.7500	1.7660	2.031	2.125	1.938	3.500	1.125	2.375
GLAC-150-S	LAC-150-S	GLAC1501S	LAC1501S	1-1/2	2.0000	2.0160	2.281	2.375	2.188	4.125	1.375	2.750
GLAC-150-SP	N/A	N/A	N/A	1-1/2	2.0000	N/A	2.281	2.375	2.188	3.900	1.150	2.750
GLAC-175-S	LAC-175-S	GLAC1751S	LAC1751S	1-3/4	2.2500	2.2660	2.531	2.625	2.438	4.625	1.625	3.000
GLAC-200-S	LAC-200-S	GLAC2001S	LAC2001S	2	2.5000	2.5160	3.031	3.125	2.938	4.625	1.625	3.000
GLAC-250-S	LAC-250-S	GLAC2501S	LAC2501S	2-1/2	3.0000	3.0160	3.531	3.625	3.438	5.375	1.875	3.500
GLAC-300-S	LAC-300-S	GLAC3001S	LAC3001S	3	3.6250	3.6410	4.281	4.375	4.188	5.875	1.875	4.000

EXTRA-LONG SHOULDER BUSHINGS – BRONZE PLATED												
PART NUMBER				D1 NOM PIN DIA	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOUL- DER OD	D5 HEAD OD GROOVE	L1 OVER- ALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 2*		Class 1*			GROUND	UNGROUND						
GROUND	UNGROUND	GROUND	UNGROUND									
GXLAC-750-S	XLAC-750-S	GXLAC7501S	XLAC7501S	3/4	1.1250	1.1410	1.219	1.313	1.125	3.563	.813	2.750
GXLAC-875-S	XLAC-875-S	GXLAC8751S	XLAC8751S	7/8	1.3750	1.3910	1.469	1.563	1.375	4.375	.875	3.500
GXLAC-100-S	XLAC-100-S	GXLAC1001S	XLAC1001S	1	1.5000	1.5160	1.656	1.750	1.563	4.375	.875	3.500
GXLAC-125-S	XLAC-125-S	GXLAC1251S	XLAC1251S	1-1/4	1.7500	1.7660	2.031	2.125	1.938	4.625	1.125	3.500
GXLAC-150-S	XLAC-150-S	GXLAC1501S	XLAC1501S	1-1/2	2.0000	2.0160	2.281	2.375	2.188	4.875	1.375	3.500

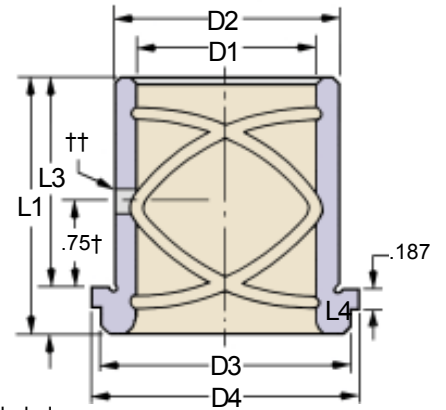
LONG & EXTRA LONG SHOULDER BUSHINGS – SOLID STEEL											
PART NUMBER		D1 NOMINAL PIN DIAMETER	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOULDER OD	D5 HEAD OD GROOVE	L1 OVERALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH	
Class 2 only*			GROUND	UNGROUND							
GROUND	UNGROUND										
GXLAC-750-SS	XLAC-750-SS	3/4	1.1250	1.1410	1.219	1.313	1.125	3.813	.813	3.000	
GXLAC-100-SS	XLAC-100-SS	1	1.5000	1.5160	1.656	1.750	1.563	3.875	.875	3.000	
GXLAC-125-SS	XLAC-125-SS	1-1/4	1.7500	1.7660	2.031	2.125	1.938	4.125	1.125	3.000	
GXLAC-150-SS	XLAC-150-SS	1-1/2	2.0000	2.0160	2.281	2.375	2.188	4.375	1.375	3.000	
GXLAC-175-SS	XLAC-175-SS	1-3/4	2.2500	2.2660	2.531	2.625	2.438	4.625	1.625	3.000	
GLAC-200-SS	LAC-200-SS	2	2.5000	2.5160	3.031	3.125	2.938	3.625	1.625	2.000	
GXLAC-200-SS	XLAC-200-SS	2	2.5000	2.5160	3.031	3.125	2.938	4.625	1.625	3.000	
GLAC-250-SS	LAC-250-SS	2-1/2	3.0000	3.0160	3.531	3.625	3.438	5.375	1.875	3.500	

Bushings – Inch – Wring Fit Style



BRONZE PLATED

Grease Fittings
 Ø3/4 - 1/4-28 NTF, 5/16 hex
 Ø7/8 - 1/8-27 NPTF, 7/16 hex



*See page 3 for details.
 See pages 16 & 17 for toe clamp placement instructions.

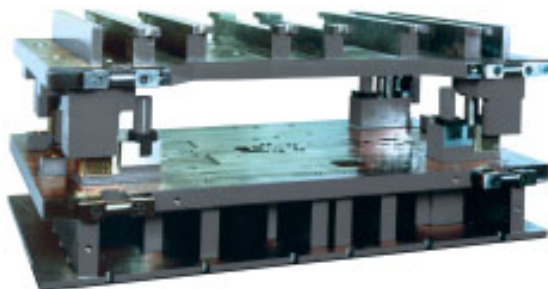
D-Clamps & Screws are included
 with wring fit style bushings.

SHORT SHOULDER BUSHINGS – BRONZE PLATED

PART NUMBER		PART NUMBER		D1 NOM PIN DIA	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOUL- DER OD	L1 OVER- ALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 2*		Class 1*			GROUND	UNGROUND					
UNGROUND	GROUND	GROUND	UNGROUND								
SC-750-S	GSC-750-S	GSC7501S	SC7501S	3/4	1.1250	1.1410	1.125	1.313	1.563	1.063	.500
SC-750-L	GSC-750-L	GSC7501L	SC7501L		2.313	1.813					
SC-875-S	GSC-875-S	GSC8751S	SC8751S	7/8	1.3750	1.3910	1.375	1.563	1.563	1.063	.500
SC-875-L	GSC-875-L	GSC8751L	SC8751L		2.313	1.813					
SC-100-S	GSC-100-S	GSC1001S	SC1001S	1	1.5000	1.5160	1.563	1.750	1.875	1.375	.500
SC-100-L	GSC-100-L	GSC1001L	SC1001L		2.875	2.375					
SC-125-S	GSC-125-S	GSC1251S	SC1251S	1-1/4	1.7500	1.7660	1.938	2.125	2.375	1.875	.500
SC-125-L	GSC-125-L	GSC1251L	SC1251L		3.375	2.875					
SC-150-S	GSC-150-S	GSC1501S	SC1501S	1-1/2	2.0000	2.0160	2.188	2.375	2.375	1.875	.500
SC-150-L	GSC-150-L	GSC1501L	SC1501L		3.375	2.875					
SC-175-S	GSC-175-S	GSC1751S	SC1751S	1-3/4	2.2500	2.2660	2.438	2.625	2.875	2.375	.500
SC-175-L	GSC-175-L	GSC1751L	SC1751L		3.875	3.375					
SC-200-S	GSC-200-S	GSC2001S	SC2001S	2	2.5000	2.5160	2.750	2.938	2.875	2.375	.500
SC-200-L	GSC-200-L	GSC2001L	SC2001L		3.875	3.375					
SC-250-S	GSC-250-S	GSC2501S	SC2501S	2-1/2	3.0000	3.0160	3.188	3.375	3.000	2.625	.375
SC-250-M	GSC-250-M	GSC2501M	SC2501M						4.000	3.625	
SC-250-L	GSC-250-L	GSC2501L	SC2501L						5.000	4.625	
SC-300-S	GSC-300-S	GSC3001S	SC3001S	3	3.5000	3.5160	3.688	3.875	4.000	3.625	.375
SC-300-M	GSC-300-M	GSC3001M	SC3001M						5.000	4.625	
SC-300-L	GSC-300-L	GSC3001L	SC3001L						6.000	5.625	

† Reference on page 9.

†† For bushing I.D.s less than 1.25, hole diameter is .188; for bushing I.D.s 1.25+, hole diameter is .344.



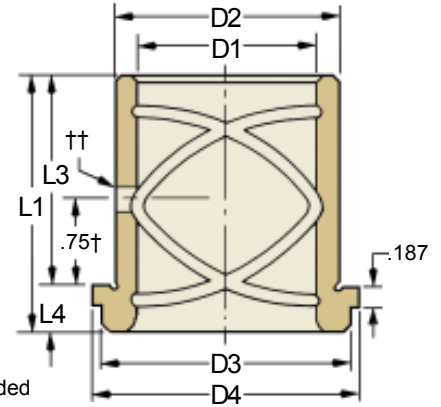
Lamina pins and bushings are used in die sets
 for the metal stamping industry.

Bushings – Inch – Wring Fit Style



SOLID BRONZE

Grease Fittings
 Ø3/4 - 1/4-28 NTF, 5/16 hex
 Ø7/8 - 1/8-27 NPTF, 7/16 hex



*See page 3 for details.

See pages 16 & 17 for toe clamp placement instructions.

D-Clamps & Screws are included with wring fit style bushings.

SHORT SHOULDER BUSHINGS – SOLID BRONZE											
PART NUMBER		PART NUMBER		D1 NOM PIN DIA	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOUL- DER OD	L1 OVER- ALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
Class 2*		Class 1*			GROUND	UNGROUND					
GROUND	UNGROUND	GROUND	UNGROUND								
GSC-750-SB	SC-750-SB	GSC7501SB	SC7501SB	3/4	1.1250	1.1410	1.125	1.313	1.563	1.063	.500
GSC-750-LB	SC-750-LB	GSC7501LB	SC7501LB						2.313	1.813	
GSC-875-SB	SC-875-SB	GSC8751SB	SC8751SB	7/8	1.3750	1.3910	1.375	1.563	1.563	1.063	.500
GSC-875-LB	SC-875-LB	GSC8751LB	SC8751LB						2.313	1.813	
GSC-100-SB	SC-100-SB	GSC1001SB	SC1001SB	1	1.5000	1.5160	1.563	1.750	1.875	1.375	.500
GSC-100-LB	SC-100-LB	GSC1001LB	SC1001LB						2.875	2.375	
GSC-125-SB	SC-125-SB	GSC1251SB	SC1251SB	1-1/4	1.7500	1.7660	1.938	2.125	2.375	1.875	.500
GSC-125-LB	SC-125-LB	GSC1251LB	SC1251LB						3.375	2.875	
GSC-150-SB	SC-150-SB	GSC1501SB	SC1501SB	1-1/2	2.0000	2.0160	2.188	2.375	2.375	1.875	.500
GSC-150-LB	SC-150-LB	GSC1501LB	SC1501LB						3.375	2.875	
GSC-175-SB	SC-175-SB	GSC1751SB	SC1751SB	1-3/4	2.2500	2.2660	2.438	2.625	2.875	2.375	.500
GSC-175-LB	SC-175-LB	GSC1751LB	SC1751LB						3.875	3.375	
GSC-200-SB	SC-200-SB	GSC2001SB	SC2001SB	2	2.5000	2.5160	2.750	2.938	2.875	2.375	.500
GSC-200-LB	SC-200-LB	GSC2001LB	SC2001LB						3.875	3.375	
GSC-250-SB	SC-250-SB	GSC2501SB	SC2501SB	2-1/2	3.0000	3.0160	3.188	3.375	3.000	2.625	.375
GSC-250-MB	SC-250-MB	GSC2501MB	SC2501MB						4.000	3.625	
GSC-250-LB	SC-250-LB	GSC2501LB	SC2501LB						5.000	4.625	
GSC-300-SB	SC-300-SB	GSC3001SB	SC3001SB	3	3.5000	3.5160	3.688	3.875	4.000	3.625	.375
GSC-300-MB	SC-300-MB	GSC3001MB	SC3001MB						5.000	4.625	
GSC-300-LB	SC-300-LB	GSC3001LB	SC3001LB						6.000	5.625	
GSC-375-B	SC-375-B	N/A	N/A	3-3/4	4.5000	4.5160	4.688	4.875	7.000	6.625	.375
GSC-450-B	SC-450-B	N/A	N/A	4-1/2	5.5000	5.5160	5.688	5.875	8.000	7.625	.375

†Bushings of 2.50" diameter and larger have 1.25" dimensions.

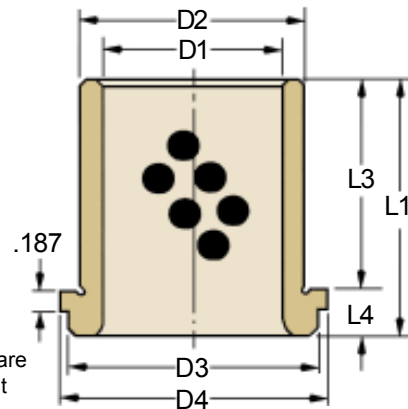
†† For bushing I.D.s less than 1.25, hole diameter is .188; for bushing I.D.s 1.25+, hole diameter is .344.

All Short Shoulder Bushings (unless otherwise noted) are to be wring fit and held in place with toe clamps & screws. This means the bushing should be installed into the die shoe using a wringing (circular) motion with the heel of the hand. Please see bore size information on page 18.

Bushings – Inch – Wring Fit Style



BRONZE with SELF-LUBRICATING GRAPHITE PLUGS



D-Clamps & Screws are included with wring fit style bushings.

*See page 3 for details.

See pages 16 & 17 for toe clamp placement instructions.

SHORT SHOULDER BUSHINGS – SELF-LUBRICATING

PART NUMBER Class 3 only*		D1 NOM PIN DIA	D2 WRING FIT DIAMETER		D3 HEAD OD	D4 SHOULDER OD	L1 OVERALL LENGTH	L3 WRING FIT LENGTH	L4 HEAD LENGTH
GROUND	UNGROUND		GROUND	UNGROUND					
GSCB750S	SCB750S	3/4	1.1250	1.1410	1.125	1.313	1.563	1.063	.500
GSCB750L	SCB750L						2.313	1.813	
GSCB875S	SCB875S	7/8	1.3750	1.3910	1.375	1.563	1.563	1.063	.500
GSCB875L	SCB875L						2.313	1.813	
GSCB100S	SCB100S	1	1.5000	1.5160	1.563	1.750	1.875	1.375	.500
GSCB100L	SCB100L						2.875	2.375	
GSCB125S	SCB125S	1-1/4	1.7500	1.7660	1.938	2.125	2.375	1.875	.500
GSCB125L	SCB125L						3.375	2.875	
GSCB150S	SCB150S	1-1/2	2.0000	2.0160	2.188	2.375	2.375	1.875	.500
GSCB150L	SCB150L						3.375	2.875	
GSCB175S	SCB175S	1-3/4	2.2500	2.2660	2.438	2.625	2.875	2.375	.500
GSCB175L	SCB175L						3.875	3.375	
GSCB200S	SCB200S	2	2.5000	2.5160	2.750	2.938	2.875	2.375	.500
GSCB200L	SCB200L						3.875	3.375	
GSCB250S	SCB250S	2-1/2	3.0000	3.0160	3.188	3.375	3.000	2.625	.375
GSCB250M	SCB250M						4.000	3.625	
GSCB250L	SCB250L						5.000	4.625	
GSCB300X	SCB300X	3	3.5000	3.5160	3.688	3.875	3.000	2.625	.375
GSCB300S	SCB300S						4.000	3.625	
GSCB300M	SCB300M						5.000	4.625	
GSCB300L	SCB300L						6.000	5.625	
GSCB375S	SCB375S	3-3/4	4.5000	4.5160	4.688	4.875	7.000	6.625	.375
GSCB450S	SCB450S	4-1/2	5.5000	5.5160	5.688	5.875	8.000	7.625	.375

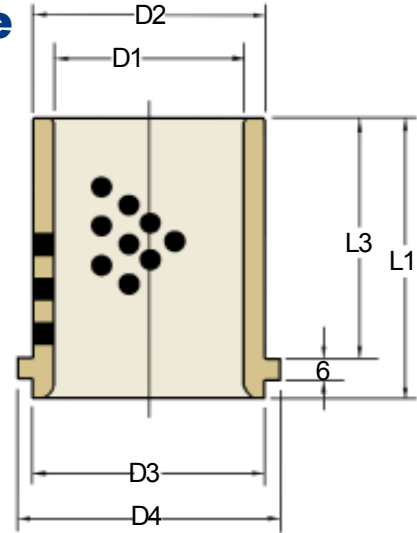
Self-lubricating bronze with graphite bushings require initial lubrication with light oil. Periodic lubrication will extend the life of self-lubricating bushings. **Do not use grease.**

Bushings – Metric – Wring Fit Style



BRONZE with SELF-LUBRICATING GRAPHITE PLUGS

G72000C Clamps & Screws are included with NAAMS wring fit style bushings.



See page 17 for toe clamp placement instructions.

SHORT-SHOULDER BUSHINGS SELF-LUBRICATING - NAAMS									
PART NUMBER	D1 NOMINAL PIN DIAMETER	D1 TOL H6	D2 WRING FIT DIAMETER	D2 Tol g6	D3	D4	L1 OVERALL LENGTH	L3 WRING FIT LENGTH	No. TOE CLAMPS & SCREWS
G612540	25	+0.13 +0.00	32	-0.09 -0.25	32	40	40	30	3
G613250	32	+0.16 +0.00	40	-0.09 -0.25	40	50	50	40	
G614063	40	+0.16 +0.00	50	-0.09 -0.25	50	63	63	50	
G615071	50	+0.16 +0.00	63	-0.10 -0.29	63	71	71	56	
G616380	63	+0.19 +0.00	80	-0.10 -0.29	80	90	80	63	
G618010	80	+0.19 +0.00	100	-0.12 -0.34	100	112	100	80	
G611012	100	+0.22 +0.00	125	-0.14 -0.39	125	140	125	106	
G611114	115	+0.22 +0.00	140	-0.14 -0.39	140	155	140	120	
G611216	125	+0.25 +0.00	160	-0.14 -0.39	160	180	160	132	

NOTE:

Evenly distributed graphite covers 20-30% of the sliding surface.

Graphite is positioned to ensure overlapping in the slide direction.

See page 17 for Toe Clamp information and 18 for bore sizes.

These short shoulder bushings are made especially for automotive stamping companies. They conform to the standards agreed to by the North American Automotive Metric Standards group.

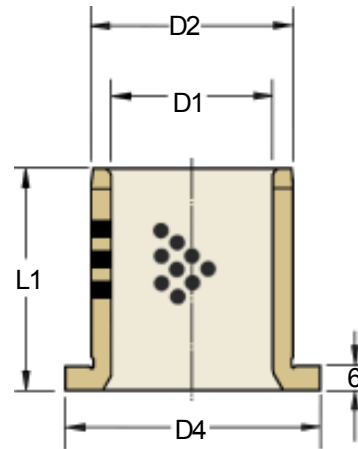
*AUTOMOTIVE METRIC
NAAMS STANDARD*

Bushings – Metric

These pad bushings are made especially for automotive stamping companies. They conform to the standards agreed to by the North American Automotive Metric Standards group.



BRONZE with SELF LUBRICATING GRAPHITE PLUGS



See page 17 for toe clamp installation instructions.

SELF-LUBRICATING PAD BUSHINGS - NAAMS

PART NUMBER	D1 NOMINAL PIN DIAMETER	D1 TOL c9	D2 WRING FIT DIAMETER	D2 TOL g6	D4	L1 OVERALL LENGTH
G712540	25	+0.162 +0.110	32	-0.009 -0.025	40	40
G713250	32	+0.182 +0.120	40	-0.009 -0.025	50	50
G714055	40	+0.182 +0.120	50	-0.009 -0.025	63	55
G715063	50	+0.192 +0.130	63	-0.010 -0.029	71	63
G716375	63	+0.214 +0.140	80	-0.010 -0.029	90	75
G718090	80	+0.224 +0.150	100	-0.012 -0.034	112	90
G711011	100	+0.257 +0.170	125	-0.014 -0.039	140	115
G711213	125	+0.300 +0.200	160	-0.014 -0.039	180	138

NOTE:

Evenly distributed graphite covers 20-30% of the sliding surface.

Graphite is positioned to ensure overlapping in the slide direction.

See page 18 for bore size information.

AUTOMOTIVE METRIC
NAAMS STANDARD

A full complement of flat products is also available from the Lamina Components line.



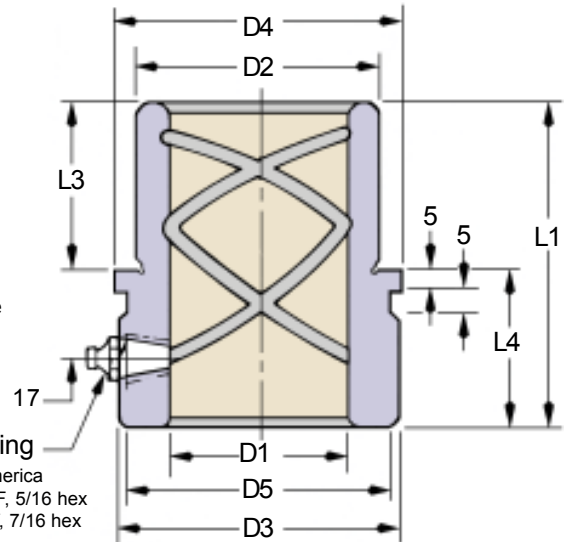
Bushings – Metric – Wring Fit Style

Bronze plated shoulder bushings are available in metric sizes.



BRONZE PLATED

D-Clamps & Screws are included with wring fit style bushings.



Grease Fittings, North America
 Ø18 & 19mm - 1/4-28 NTF, 5/16 hex
 Ø24-80mm - 1/8-27 NPTF, 7/16 hex

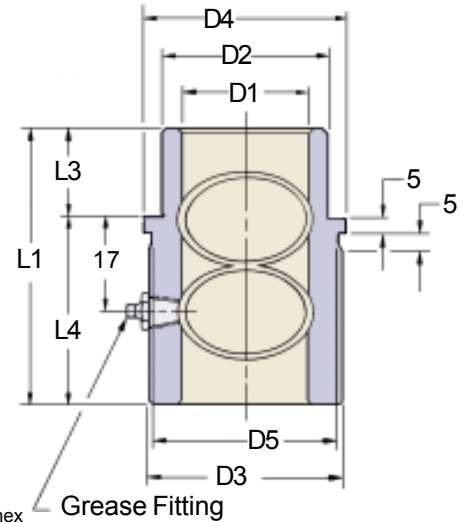
See pages 16 & 17 for toe clamp installation instructions.

STANDARD SHOULDER BUSHINGS – BRONZE PLATED – METRIC												
PART NUMBER		NOM PIN DIA	D1	D2 WRING FIT DIAMETER		D3 HEAD O.D.	D4 SHOULDER O.D. +0.13 -0.00	D5 HEAD OD GROOVE	L1 OVERALL LENGTH +0.00 -0.26	L3 WRING FIT LENGTH +0.00 -0.26	L4 HEAD LENGTH	NO. CLAMPS & SCREWS
(Ground)	(Unground)			(Ground)	(Unground)							
GAC-18S	AC-18S	18	18.011 18.005	28.000 27.995	28.406	31.00	34.00	29.00	50.00	18.00	32.00	2
GAC-19S	AC-19S	19	19.011 19.005	28.000 27.995	28.406	31.00	34.00	29.00	50.00	18.00	32.00	2
GAC-24S	AC-24S	24	24.011 24.005	38.000 37.992	38.406	41.00	44.00	39.00	55.00	23.00	32.00	3
GAC-25S	AC-25S	25	25.011 25.005	38.000 37.992	38.406	41.00	44.00	39.00	55.00	23.00	32.00	3
GAC-30S	AC-30S	30	30.014 30.008	45.000 44.992	45.406	50.00	53.00	48.00	60.00	26.00	34.00	3
GAC-32S	AC-32S	32	32.014 32.008	45.000 44.992	45.406	50.00	53.00	48.00	60.00	26.00	34.00	3
GAC-40S	AC-40S	40	40.014 40.008	54.000 53.992	54.406	60.00	63.00	58.00	67.00	30.00	37.00	3
GAC-42S	AC-42S	42	42.014 42.008	54.000 53.992	54.406	60.00	63.00	58.00	67.00	30.00	37.00	3
GAC-50S	AC-50S	50	50.014 50.008	65.000 64.992	65.406	76.00	79.00	74.00	75.00	35.00	40.00	4
GAC-52S	AC-52S	52	52.014 52.008	65.000 64.992	65.406	76.00	79.00	74.00	75.00	35.00	40.00	4
GAC-63S	AC-63S	63	63.016 63.010	81.000 80.990	81.406	89.00	92.00	87.00	88.00	46.00	42.00	4
GAC-80S	AC-80S	80	80.016 80.010	100.000 99.990	100.406	108.00	111.00	106.00	98.00	46.00	52.00	4

*Unground wring fit tolerance is +0.000 -0.013.

All Standard Shoulder Bushings (unless otherwise noted) are to be wring fit and held in place with toe clamps and screws. This means the bushing should be installed into the die shoe using a wringing (circular) motion with the heel of the hand. Please see clamping information on page 16 & 17 and bore size information on page 18.

Bushings – Metric – Wring Fit Style



D-Clamps & Screws are included with wring fit style bushings.

Grease Fittings, North America
 Ø18 & 19mm - 1/4-28 NTF, 5/16 hex
 Ø24-80mm - 1/8-27 NPTF, 7/16 hex

Grease Fitting

See pages 16 & 17 for toe clamp placement instructions.

LONG & EXTRA LONG SHOULDER BUSHINGS – BRONZE PLATED – METRIC												
PART NUMBER		NOM PIN DIA	D1	D2 WRING FIT O.D.		D3 HEAD O.D.	D4 SHOULDER O.D. +0.13 -0.00	D5 HEAD OD GROOVE	L1 OVERALL LENGTH +0.00 -0.26	L3 WRING-FIT LENGTH +0.00 -0.26	L4 HEAD LENGTH	NO. CLAMPS & SCREWS
(Ground)	(Unground)			(Ground)	(Unground)							
GLAM-18F GLAC-18S	LAM-18F LAC-18S	18	18.011 18.005	28.000 27.995	28.406	31.00	34.00	29.00	69.00 70.00	26.00 18.00	43.00 52.00	2
GLAM-19F GLAC-19S	LAM-19F LAC-19S	19	19.011 19.005	28.000 27.995	28.406	31.00	34.00	29.00	69.00 70.00	26.00 18.00	43.00 52.00	2
GLAM-24F GLAC-24S	LAM-24F LAC-24S	24	24.011 24.005	38.000 37.992	38.406	41.00	44.00	39.00	80.00 80.00	32.00 23.00	48.00 57.00	3
GLAM-25F GLAC-25S	LAM-25F LAC-25S	25	25.011 25.005	38.000 37.992	38.406	41.00	44.00	39.00	80.00 80.00	32.00 23.00	48.00 57.00	3
GLAM-30F GLAC-30S	LAM-30F LAC-30S	30	30.014 30.008	45.000 44.992	45.406	50.00	53.00	48.00	89.00 90.00	36.00 26.00	53.00 64.00	3
GLAM-32F GLAC-32S	LAM-32F LAC-32S	32	32.014 32.008	45.000 44.992	45.406	50.00	53.00	48.00	89.00 90.00	36.00 26.00	53.00 64.00	3
GLAM-40F GLAC-40S	LAM-40F LAC-40S	40	40.014 40.008	54.000 53.992	54.406	60.00	63.00	58.00	99.00 100.00	46.00 30.00	53.00 70.00	3
GLAM-42F GLAC-42S	LAM-42F LAC-42S	42	42.014 42.008	54.000 53.992	54.406	60.00	63.00	58.00	99.00 100.00	46.00 30.00	53.00 70.00	3
GLAM-50F GLAC-50S	LAM-50F LAC-50S	50	50.014 50.008	65.000 64.992	65.406	76.00	79.00	74.00	109.00 110.00	56.00 35.00	53.00 75.00	4
GLAM-52F GLAC-52S	LAM-52F LAC-52S	52	52.014 52.008	65.000 64.992	65.406	76.00	79.00	74.00	109.00 110.00	56.00 35.00	53.00 75.00	4
GLAM-63F GLAC-63S	LAM-63F LAC-63S	63	63.016 63.010	81.000 80.990	81.406	89.00	92.00	87.00	129.00 128.00	66.00 46.00	63.00 82.00	4
GLAM-80F GLAC-80S	LAM-80F LAC-80S	80	80.016 80.010	100.000 99.990	100.406	108.00	111.00	106.00	149.00 148.00	76.00 46.00	73.00 102.00	4

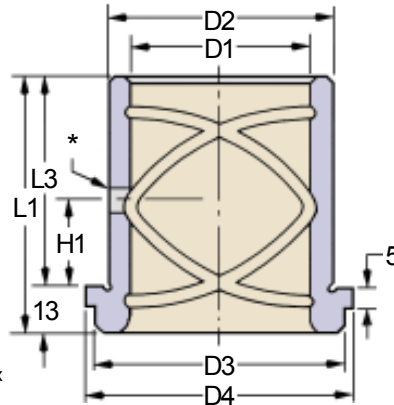
*Unground wring fit tolerance is +0.000 -0.013.

All Standard Shoulder Bushings (unless otherwise noted) are to be wring fit and held in place with toe clamps and screws. This means that the bushing should be installed into the die shoe using a wringing (circular) motion with the heel of the hand. Please see clamping information on page 16 & 17 and bore size information on page 18.

Bushings – Metric – Wring Fit Style



Grease Fittings, North America
 Ø18 & 19mm - 1/4-28 NTF, 5/16 hex
 Ø24-80mm - 1/8-27 NPTF, 7/16 hex



*Ø4.76 for bushings with nom. I.D.s between 18 & 32mm.

*Ø8.73 for bushings with nom. I.D.s between 40 & 80mm.

D-Clamps & Screws are included with wring fit style bushings.

See pages 16 & 17 for toe clamp placement instructions.

SHORT SHOULDER BUSHINGS – BRONZE PLATED – METRIC

PART NUMBER		NOM PIN DIA	D1	D2 WRING FIT DIAMETER		D3 HEAD O.D.	D4 SHOULDER OD +0.13 -0.00	L1 OVERALL LENGTH +0.00 -0.26	L3 WRING FIT LENGTH +0.00 -0.26	H1 LUBE HOLE CENTER	NO. CLAMPS & SCREWS
GROUND	UNGROUND			GROUND	UNGROUND						
GSC-18S	SC-18S	18	18.011	28.000	28.406	29.00	34.00	31.00	18.00	8.00	2
GSC-18F	SCL-18F		18.005	27.995				49.00	36.00		
GSC-19S	SC-19S	19	19.011	28.000	28.406	29.00	34.00	31.00	18.00	8.00	2
GSC-19F	SCL-19F		19.005	27.995				49.00	36.00		
GSC-24S	SC-24S	24	24.011	38.000	38.406	39.00	44.00	36.00	23.00	12.00	3
GSC-24F	SCL-24F		24.005	37.992				55.00	42.00		
GSC-25S	SC-25S	25	25.011	38.000	38.406	39.00	44.00	36.00	23.00	12.00	3
GSC-25F	SCL-25F		25.005	37.992				55.00	42.00		
GSC-30S	SC-30S	30	30.014	45.000	45.406	48.00	53.00	43.00	30.00	15.00	3
GSC-30F	SCL-30F		30.008	44.992				59.00	46.00		
GSC-32S	SC-32S	32	32.014	45.000	45.406	48.00	53.00	43.00	30.00	15.00	3
GSC-32F	SCL-32F		32.008	44.992				59.00	46.00		
GSC-40S	SC-40S	40	40.014	54.000	54.406	58.00	63.00	49.00	36.00	19.00	3
GSC-40F	SCL-40F		40.008	53.992				67.00	54.00		
GSC-42S	SC-42S	42	42.014	54.000	54.406	58.00	63.00	49.00	36.00	19.00	3
GSC-42F	SCL-42F		42.008	53.992				67.00	54.00		
GSC-50S	SC-50S	50	50.014	65.000	65.406	74.00	79.00	59.00	46.00	19.00	4
GSC-50F	SCL-50F		50.008	64.992				75.00	62.00		
GSC-52S	SC-52S	52	52.014	65.000	65.406	74.00	79.00	59.00	46.00	19.00	4
GSC-52F	SCL-52F		52.008	64.992				75.00	62.00		
GSC-63S	SC-63S	63	63.016	81.000	81.406	87.00	92.00	74.00	61.00	19.00	4
GSC-63F	SCL-63F		63.010	80.990				89.00	76.00		
GSC-80S	SC-80S	80	80.016	100.000	100.406	106.00	111.00	89.00	76.00	19.00	4

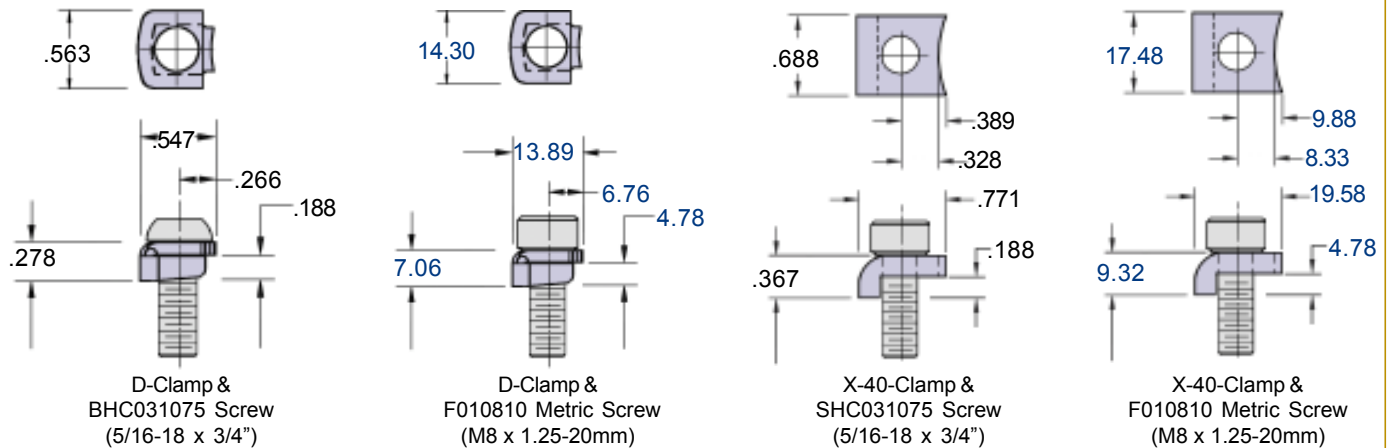
*Unground wring fit tolerance is +0.000 –0.013.

All Standard Shoulder Bushings (unless otherwise noted) are to be wring fit and held in place with toe clamps and screws. This means that the bushing should be installed into the die shoe using a wringing (circular) motion with the heel of the hand. Please see clamping information on page 16 & 17 and bore size information on page 18.

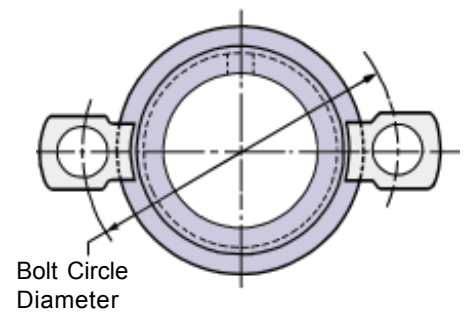
Toe Clamp Information for Inch & Metric Plain Bearing Die Bushings

CLAMP & SCREW PLACEMENT											
INCH								METRIC			
Bushing ID	# Provided	Bolt Circle Diameter						Bushing ID AC, LAM, LAC, SC	# Provided	Bolt Circle Diameter	
		D-Clamps			X-40 Clamps					D-Clamps	X-40 Clamps
		AC, LAC, XLAC	SC	LMB	AC, LAC, XLAC	SC	LMB				
.625	2	N/A	N/A	1.531	N/A	N/A	1.644	18	2	45	47.18
.750	2	1.719	1.719	1.719	1.831	1.831	1.891	19	2	45	47.18
.875	2	1.969	1.969	N/A	2.081	2.081	N/A	24	3	55	57.18
1.00	3	2.156	2.156	2.156	2.269	2.269	2.269	25	3	55	57.18
1.25	3	2.531	2.531	2.531	2.644	2.644	2.644	30	3	64	66.18
1.50	3	2.781	2.781	2.781	2.894	2.894	2.894	32	3	64	66.18
1.75	3	3.031	3.031	3.031	3.144	3.144	3.144	40	3	74	76.18
2.00	4	3.531	3.344	3.344	3.644	3.456	3.456	42	3	74	76.18
2.50	4	4.031	3.781	4.031	4.174	3.894	4.174	50	4	90	92.18
3.00	6	4.781	4.281	4.531	4.944	4.424	4.694	52	4	90	92.18
3.75	6	5.281	5.281	5.281	5.281	5.424	5.444	63	4	103	105.94
4.50	6	6.281	6.281	6.281	6.281	6.444	6.444	80	4	122	125.45

Toe Clamp Dimensions



REPLACEMENT KITS CLAMPS & SCREWS							
D-Clamps							
PART NUMBER	Nom Pin Diameters	# Clamps & Screws per Kit	No. of Kits Needed	PART NUMBER	Nom Pin Diameters	# Clamps & Screws per Kit	No. of Kits Needed
CSK100002	5/8 - 7/8	2	1	CSK10052	18 - 19	2	1
CSK100003	1 - 1-3/4	3	1	CSK10053	24 - 42	3	1
CSK100002	2 - 2-1/2	2	2	CSK10052	50 - 80	2	2
CSK100003	3 - 4-1/2	3	2				
X40-Clamps							
CSK200002	5/8 - 7/8	2	1	CSK20052	18 - 19	2	1
CSK200003	1 - 1-3/4	3	1	CSK20053	24 - 42	3	1
CSK200002	2 - 2-1/2	2	2	CSK20052	50 - 80	2	2
CSK200003	3 - 4-1/2	3	2				



Drawing above can refer to either D-Clamps or X-40-Clamps

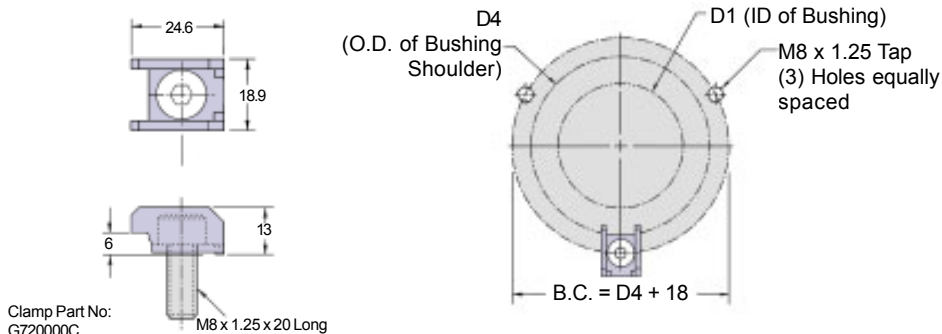
Toe Clamp Information for Inch & Metric Demountable Components

BALL-BEARING DEMOUNTABLE COMPONENT CLAMP ARRANGEMENTS				BOLT CIRCLE DIAMETERS	
NOM. PIN DIA.	STANDARD LEFT - RIGHT FEED	FRONT to BACK FEED (Center Post Die Sets)	ROUND DIES	DEMOUNTABLE BALL BEARING BUSHINGS	
				Nominal Bushing Diameter	Bolt Circle Diameter
1, 1 1/4, & 1 1/2				1	2.438
1 3/4, 2, 2 1/2 & 3				1-1/4	2.813
1 3/4, 2, 2 1/2 & 3				1-1/2	3.125
1 3/4, 2, 2 1/2 & 3				1-3/4	3.438
				2	4.000
				2-1/2	4.500
				3	5.000
				DEMOUNTABLE BALL BEARING & PLAIN BEARING PINS	
				Nominal Pin Diameter	Bolt Circle Diameter
				1	1.750
				1-1/4	2.000
				1-1/2	2.250
				1-3/4	2.625
				2	2.875
				2-1/2	3.375
				3	3.875
				KEYLESS DEMOUNTABLE BALL BEARING BUSHINGS	
				Nominal Bushing Diameter	Bolt Circle Diameter
				1	2.625
				1-1/4	2.875
				1-1/2	3.375
				1-3/4	3.625
				2	4.125
				2-1/2	4.625
				3	5.250
				KEYLESS DEMOUNTABLE BALL BEARING PINS	
				Nominal Pin Diameter	Bolt Circle Diameter
				1	1.625
				1-1/4	1.969
				1-1/2	2.250
				1-3/4	2.594
				2	2.884
				2-1/2	3.344
				3	3.844

BUSHING CLAMPING PROCEDURES

AUTOMOTIVE METRIC

NAAMS STANDARD



D1	D4	B.C. (D4 + 18)
25	40	58
32	50	68
40	63	81
50	71	89
63	90	108
80	112	130
100	140	158
115	155	173
125	180	198

NOTES & SPECIFICATION:

Bushings will be supplied with (3) toe clamps and (3) screws - M8. Screws must engage 16mm minimum deep into die shoe.



RECOMMENDED BORE SIZES for PLAIN BEARING PINS & BUSHINGS

Nom. Pin Diameter	Standard Inch GAC GLAC & GSC Style Bushings	Standard Metric GAC, GLAC, GLAM & GSC Style Bushings	Short Shoulder & Pad Bushings NAAMS	Bushing Liner For Removable Pin	Straight Guide Pins Inch TN & ATN	Straight Guide Pins Metric TN	Straight Guide Pins Inch TPC	Straight Guide Pins NAAMS	Guide Pins with Shoulders NAAMS	Demountable Inch Guide Pins	Standard Metric Guide Pins							
	Wring Fit	Wring Fit	Wring Fit	Pressed Fit	Pressed Fit	Pressed Fit	Pressed Fit	Pressed Fit	Tap Fit	Tap Fit	Tap Fit							
3/4"	1.1255 1.1250	N/A	N/A	N/A	0.7485 0.7480	N/A	0.7505 0.7500	N/A	N/A	N/A	N/A							
7/8"	1.3755 1.3750			N/A	N/A		0.8755 0.8750			N/A		N/A						
1"	1.5005 1.5000			1.4988 1.4983	0.9985 0.9980		1.0005 1.0000			1.0005 1.0000		1.0005 1.0000						
1-1/4"	1.7505 1.7500			1.7488 1.7483	1.2480 1.2475		1.2505 1.2500			1.2505 1.2500		1.2505 1.2500						
1-1/2"	2.0005 2.0000			1.9983 1.9978	1.4980 1.4975		1.5005 1.5000			1.5005 1.5000		1.5005 1.5000						
1-3/4"	2.2505 2.2500			2.2483 2.2478	1.7480 1.7475		1.7505 1.7500			1.7505 1.7500		1.7505 1.7500						
2"	2.5005 2.5000			2.4983 2.4978	1.9975 1.9970		1.9995 2.0000			1.9995 2.0000		1.9995 2.0000						
2-1/2"	3.0005 3.0000			2.9983 2.9978	2.4975 2.4970		2.4995 2.5000			2.4995 2.5000		2.4995 2.5000						
3" GSC Only	3.5005 3.5000			N/A	N/A		N/A			N/A		N/A						
3"	3.6255 3.6250			3.4983 3.4978	2.9975 2.9970		2.9995 3.0000			2.9995 3.0000		2.9995 3.0000						
3-3/4"	4.5005 4.5000			N/A	N/A		3.7495 3.7500			3.7495 3.7500		3.7495 3.7500						
4-1/2"	5.5005 5.5000			N/A	N/A		4.4995 4.5000			4.4995 4.5000		4.4995 4.5000						
18mm	N/A			28.013 28.000	N/A		N/A			N/A		N/A	N/A	N/A	N/A	N/A	N/A	
19mm				28.013 28.000	N/A							18.980 18.959					N/A	N/A
24mm				38.016 38.000	N/A							N/A					N/A	N/A
25mm				38.016 38.000	N/A							24.980 24.959					N/A	N/A
30mm		45.016 45.000	N/A	N/A	N/A	N/A												
32mm		45.016 45.000	40.025 40.000	31.975 31.950	32.025 32.000	32.060 32.050												
40mm		54.019 54.000	50.025 50.000	N/A	40.025 40.000	40.050 40.060												
42mm		54.019 54.000	N/A	N/A	N/A	N/A												
50mm		65.019 65.000	63.030 63.000	N/A	50.025 50.000	50.060 50.050												
52mm		65.019 65.000	N/A	N/A	N/A	N/A												
63mm		81.022 81.000	80.030 80.000	N/A	63.030 63.000	63.070 63.060												
80mm		100.022 100.000	100.035 100.000	N/A	80.030 80.000	80.072 80.062												
100mm		N/A	125.040 125.000	N/A	100.035 100.000	100.083 100.073												
115mm		N/A	140.040 140.000	N/A	115.035 115.000	115.035 115.000												
125mm		N/A	160.040 160.000	N/A	125.040 125.000	125.040 125.000												

DEFINITIONS OF MOUNTING PROCEDURES

Pins and bushings require specific mounting procedures. By following these procedures the components should give maximum life and reduce downtime due to improper alignment, breakage and uneven wear.

Pressed Fit – The component is installed in an interference condition: the bore size is smaller than the pressed fit portion of the component.

Bushings that require a pressed fit should never be frozen or hammered. They should be forced into place using a hydraulic press or other proper tooling. Improper methods can permanently change the tolerance of the component.

Pins can be forced into place using a hydraulic press; or the pins can be frozen and pressed into place. **Lamina does not recommend hammering pins into place. Hammering can cause the pins to 'mushroom' or**

expand on the pin end resulting in permanent distortion of the component.

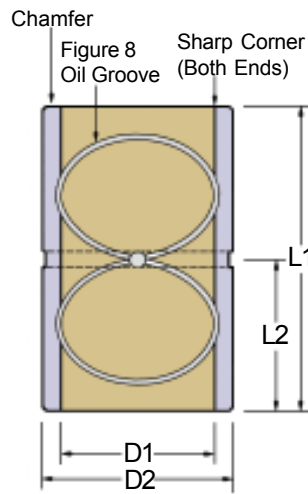
Tap Fit – The component should be tapped using a soft hammer into the bored hole and secured with toe clamps.

Wring Fit – The component should be installed using a wringing (circular) motion with the heel of the hand. Wring fit components are to be held in place with toe clamps, retaining rings or plates.

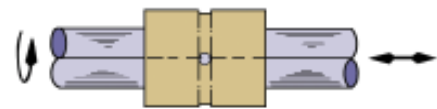
Bearings – Pressed Fit



HEAT TREATED



- For Machine Tools, Fixtures, etc.
- Straight Design, Wiper type
- Lamina-Bronze on steel provides longer wearing running fits
- Plating thickness .005–.007 per side
- No reaming or honing after press fitting bearing.

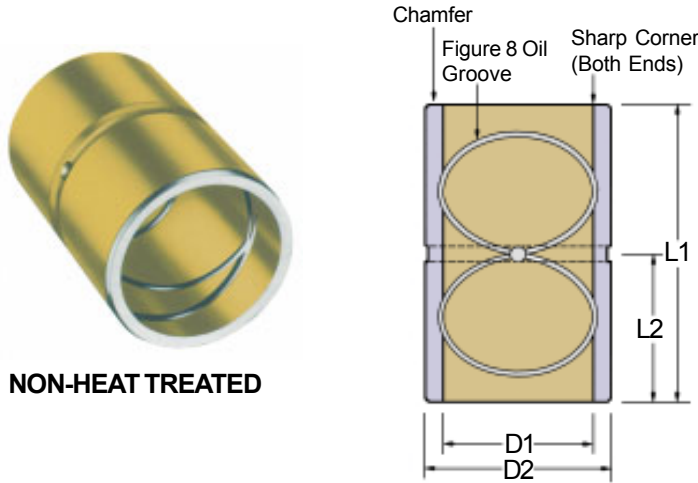


Bearings for Radial or Linear Applications

BEARINGS – RUNNING FIT – HARDENED									
PART NUMBER	D1 I.D. +.0005 -.0000	D2 O.D. +.0004 -.0000	RECOM-MENDED BORE SIZE +.0005 -.0000	L LENGTH	PART NUMBER	D1 I.D. +.0005 -.0000	D2 O.D. +.0004* -.0000	RECOM-MENDED BORE SIZE +.0005 -.0000	L LENGTH
625-x-75-RFB	.6270	1.0014	.9995	.75	175-x-175-RFB	1.7530	2.2518	2.2495	1.75
625-x-100-RFB				1.00	175-x-200-RFB				2.00
625-x-125-RFB				1.25	175-x-250-RFB				2.50
750-x-75-RFB	.7525	1.1264	1.1245	.75	175-x-300-RFB	2.0035	2.5018	2.4995	3.00
750-x-100-RFB				1.00	175-x-350-RFB				3.50
750-x-125-RFB				1.25	200-x-200-RFB				2.00
750-x-150-RFB	1.0025	1.3764	1.3745	1.50	200-x-250-RFB	2.5035	3.2518	3.2490	2.50
100-x-100-RFB				1.00	200-x-300-RFB				3.00
100-x-125-RFB				1.25	200-x-350-RFB				3.50
100-x-150-RFB	1.2530	1.7516	1.7495	1.75	250-x-250-RFB	3.0040	3.7520	3.7490	2.50
100-x-175-RFB				2.00	250-x-300-RFB				3.00
100-x-200-RFB				2.50	250-x-350-RFB				3.50
125-x-125-RFB	1.5030	2.0016	1.9995	1.25	250-x-400-RFB	3.0040	3.7520	3.7490	4.00
125-x-150-RFB				1.50	250-x-450-RFB				4.50
125-x-175-RFB				1.75	250-x-500-RFB				5.00
125-x-200-RFB	1.5030	2.0016	1.9995	2.00	300-x-300-RFB	3.0040	3.7520	3.7490	3.00
125-x-250-RFB				2.50	300-x-350-RFB				3.50
150-x-150-RFB				1.50	300-x-400-RFB				4.00
150-x-175-RFB	1.5030	2.0016	1.9995	1.75	300-x-450-RFB	3.0040	3.7520	3.7490	4.50
150-x-200-RFB				2.00	300-x-500-RFB				5.00
150-x-250-RFB				2.50	300-x-600-RFB				6.00

*This diameter only.

Bearings – Pressed Fit



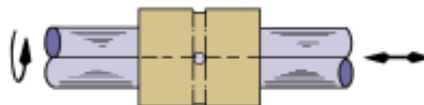
NON-HEAT TREATED

- For Machine Tools, Fixtures, etc.
- Straight Design, Wiper type
- Lamina-Bronze on steel provides longer wearing running fits
- Plating thickness .005–.007 per side
- No reaming or honing after press fitting bearing.
- Flash-plated O.D. prevents scoring when pressing bearing in and out

BEARINGS – RUNNING FIT – NON-HEAT-TREATED

PART NUMBER	D1 I.D. +0.005 -0.000	D2 O.D. +0.004 -0.000	RECOM- MENDED BORE SIZE +0.005 -0.000	L LENGTH	PART NUMBER	D1 I.D. +0.005 -0.000	D2 O.D. +0.004 -0.000	RECOM- MENDED BORE SIZE +0.005 -0.000	L LENGTH
SRFB-75-x-75	.7525	1.1265	1.1245	.75	SRFB-175-x-200	1.7530	2.1265	2.1245	2.00
SRFB-75-x-100				1.00	SRFB-175-x-225				2.25
SRFB-75-x-125				1.25	SRFB-175-x-250				2.50
SRFB-75-x-150				1.50	SRFB-175-x-300				3.00
SRFB-100-x-75	1.0025	1.3765	1.3745	.75	SRFB-200-x-100	2.0035	2.3765	2.3745	1.00
SRFB-100-x-100				1.00	SRFB-200-x-125				1.25
SRFB-100-x-125				1.25	SRFB-200-x-150				1.50
SRFB-100-x-150				1.50	SRFB-200-x-200				2.00
SRFB-100-x-175				1.75	SRFB-200-x-250				2.50
SRFB-100-x-200				2.00	SRFB-200-x-300				3.00
SRFB-125-x-75	1.2530	1.6265	1.6545	.75	SRFB-200-x-350	2.5035	2.8765	2.8745	3.50
SRFB-125-x-100				1.00	SRFB-200-x-400				4.00
SRFB-125-x-125				1.25	SRFB-250-x-125				1.25
SRFB-125-x-150				1.50	SRFB-250-x-150				1.50
SRFB-125-x-175				1.75	SRFB-250-x-200				2.00
SRFB-125-x-200				2.00	SRFB-250-x-250				2.50
SRFB-125-x-250				2.50	SRFB-250-x-300				3.00
SRFB-150-x-75				1.5030	1.8765				1.8745	.75	SRFB-250-x-350	3.0040	3.5020	3.4995	3.50
SRFB-150-x-100	1.00	SRFB-250-x-400	4.00						
SRFB-150-x-125	1.25	SRFB-250-x-500	5.00						
SRFB-150-x-150	1.50	SRFB-300-x-150	1.50						
SRFB-150-x-175	1.75	SRFB-300-x-200	2.00						
SRFB-150-x-200	2.00	SRFB-300-x-250	2.50						
SRFB-150-x-250	2.50	SRFB-300-x-300	3.00						
SRFB-175-x-100	1.7530	2.1265	2.1245	1.00	SRFB-300-x-350	3.0040	3.5020	3.4995	3.50
SRFB-175-x-125				1.25	SRFB-300-x-400				4.00
SRFB-175-x-150				1.50	SRFB-300-x-500				5.00
SRFB-175-x-175				1.75	SRFB-300-x-600				6.00

*This diameter only.



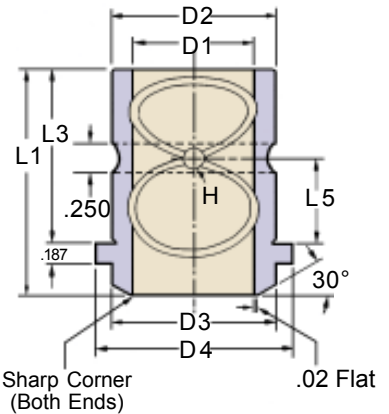
Bearings for Radial or Linear Applications

Wiper Bushings – Wring Fit Style

- Used in Transfer Machinery
- Bronze Plated Steel for strength and lubricity



Wiper Head

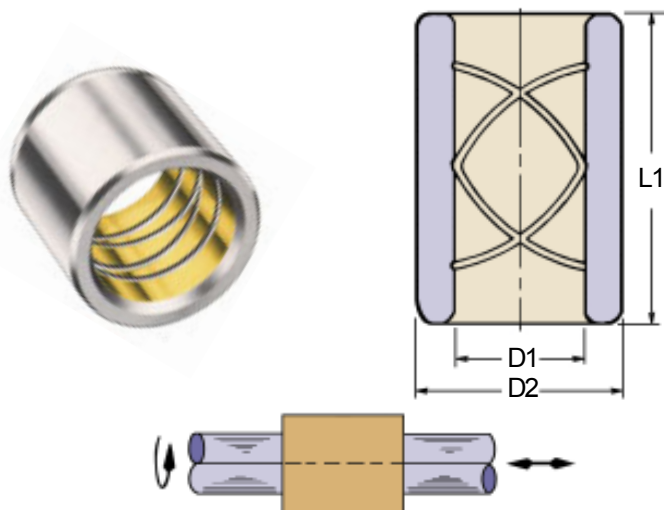


Guide Bar Bushings are to be wring fit and held in place with toe clamps & screws. Please see clamping information on page 16 & 17 and bore size information on page 18.

GUIDE BAR BUSHINGS													
PART NUMBER		D1	D2		D3	D4	L1	L3	L4	L5	H	NO CLAMPS & SCREWS	Recommended Bore Size
Ground	Unground		Ground	Unground									
GLMB-062	LMB-062	$\frac{.6254}{.6252}$	1.0000	1.0160	.930	1.125	1.210	.750	.460	.370	.188	2	1.0005 1.0000
GLMB-075	LMB-075	$\frac{.7504}{.7502}$	1.1250	1.1410	1.120	1.313	1.230	.750	.480	.370	.188		1.1255 1.1250
GLMB-100	LMB-100	$\frac{1.0004}{1.0002}$	1.3750	1.3910	1.560	1.750	1.550	1.000	.550	.490	.188	3	1.3755 1.3750
GLMB-125	LMB-125	$\frac{1.2504}{1.2502}$	1.7500	1.7660	1.930	2.125	1.940	1.375	.565	.690	.188		1.7505 1.7500
GLMB-150	LMB-150	$\frac{1.5004}{1.5002}$	2.0000	2.0160	2.180	2.375	2.060	1.500	.560	.750	.188	3	2.0005 2.0000
GLMB-175	LMB-175	$\frac{1.7504}{1.7502}$	2.2500	2.2660	2.430	2.625	2.310	1.750	.560	.880	.188		2.2505 2.2500
GLMB-200	LMB-200	$\frac{2.0004}{2.0002}$	2.5000	2.5160	2.750	2.938	2.570	2.000	.570	1.000	.250	4	2.5005 2.5000
GLMB-250	LMB-250	$\frac{2.5006}{2.5004}$	3.2500	3.2660	3.430	3.625	3.120	2.500	.620	1.250	.250		3.2505 3.2500
GLMB-300	LMB-300	$\frac{3.0008}{3.0006}$	3.7500	3.7660	3.930	4.125	3.620	3.000	.620	1.500	.250	6	3.7505 3.7500
GLMB-375	LMB-375	$\frac{3.7508}{3.7506}$	4.5000	4.5160	4.680	4.875	4.370	3.750	.620	1.870	.250		4.5005 4.5000
GLMB-450	LMB-450	$\frac{4.5008}{4.5006}$	5.5000	5.5160	5.680	5.875	5.200	4.500	.700	2.250	.250	6	5.5005 5.5000

D-Clamps & Screws are included with wring fit style bushings.

Bearings – Pressed Fit



Bearings for Radial or Linear Applications

PRECISION BEARINGS					
	PART NUMBER	D1 NOM. PIN DIAMETER	D1	D2	L
			STANDARD	B-6-175		3/4	$\frac{.7502}{.7500}$	$\frac{1.1272}{1.1268}$	1-3/4
B-7-175	7/8	$\frac{.8752}{.8750}$	$\frac{1.3772}{1.3768}$		
B-8-175	1	$\frac{1.0002}{1.0000}$	$\frac{1.5022}{1.5018}$		
EXTRA-LONG	B-10-200	1-1/4	$\frac{1.2502}{1.2500}$	$\frac{1.7522}{1.7518}$	2
	B-12-200	1-1/2	$\frac{1.5002}{1.5000}$	$\frac{2.0022}{2.0018}$	
	B-7-300	7/8	$\frac{.8752}{.8750}$	$\frac{1.3772}{1.3768}$	3
	B-8-300	1	$\frac{1.0002}{1.0000}$	$\frac{1.5022}{1.5018}$	
	B-10-300	1-1/4	$\frac{1.2512}{1.2500}$	$\frac{1.7522}{1.7518}$	
	B-12-300	1-1/2	$\frac{1.5002}{1.5000}$	$\frac{2.0022}{2.0018}$	
	B-14-300	1-3/4	$\frac{1.7502}{1.7500}$	$\frac{2.2522}{2.2518}$	
	B-16-300	2	$\frac{2.0002}{2.0000}$	$\frac{2.5022}{2.5018}$	
B-20-300	2-1/2	$\frac{2.5002}{2.5000}$	$\frac{3.0022}{3.0018}$		

General Information – Guide Pins

Below are listed standard diameters and minimum/maximum lengths that we are able to machine to your specifications. We can also manufacture in-between diameters.

We are able to make specials to meet your exact specifications. Please call, fax or e-mail for a quotation form. Phone: 248-489-9122, 800-652-6462; Fax: 248-553-6842, 800-406-4410; E-mail: sales@lamina.com. **Every quote will be answered!**

MINIMUM & MAXIMUM PIN LENGTHS					
INCH			METRIC		
Outside Diameter	Minimum Length	Maximum Length	Outside Diameter	Minimum Length	Maximum Length
0.625	1"	12"	•	•	•
0.750	1"	12"	18 & 19mm	25mm	300mm
0.875	1"	12"	•	•	•
1.000	1"	12"	24 & 25mm	25mm	300mm
1.125	2"	12"	•	•	•
1.250	2"	18"	30 & 32mm	50mm	440mm
1.375	2"	18"	•	•	•
1.500	2"	26"	•	•	•
1.625	2"	26"	•	•	•
1.750	2"	28"	40 & 42mm	50mm	440mm
1.875	2"	28"	•	•	•
2.000	3"	30"	50 & 52mm	75mm	750mm
2.125	3"	30"	•	•	•
2.375	3"	30"	•	•	•
2.500	3"	30"	63mm	75mm	750mm
2.625	3"	30"	•	•	•
2.750	3"	36"	•	•	•
3.000	4"	36"	•	•	•
3.125	4"	36"	•	•	•
3.250	4"	36"	80mm	100mm	900mm
3.375	4"	36"	•	•	•
3.500	4"	36"	•	•	•
3.625	4"	48"	•	•	•
3.750	4"	56"	•	•	•
3.875	4"	56"	•	•	•
4.000	5"	60"	100mm	125mm	1470mm
4.125	5"	60"	•	•	•
4.250	5"	60"	•	•	•
4.375	5"	60"	•	•	•
4.500	5"	60"	115mm	125mm	1470mm
4.625	5"	60"	•	•	•
4.750	5"	60"	•	•	•
4.875	5"	60"	•	•	•
5.000	5"	60"	125mm	125mm	1470mm

TN, ATN, TPB & TPC

STRAIGHT PINS

Lamina TPB & TPC Pins dimensions shown opposite for use in precision die sets.

(Pins Available in Class 2)

SHOULDER PINS

For use with automotive, hardware, forming, or draw dies where stamping stock is thicker than 1/16", and clearances between punch and die sections will be more than .003" per side.

(Pins available in Class 2)

REMOVABLE PINS

Designed specifically for all dies where it is desirable to remove pins for ease and simplicity of sharpening die.

Lamina removable pins are generally used in carbide dies, progressive dies, lamination dies, and dies for very thin materials where clearances between punch and die sections will be no more than .0007" per side.

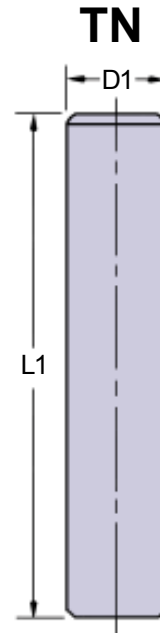
DIE PIN TOLERANCES						
Diameter	D1 Dimension				D2 Dimension	
	TN Tolerance	ATN Tolerance	HP Tolerance	TPB & TPC Tolerance	TPC Press Tolerance	Press Diameter
0.7500	+0.0000 -0.0002	N/A	N/A	+0.0000 -0.0003	+0.0000 -0.0006	0.7520
0.8750	N/A	N/A	N/A	+0.0000 -0.0003	+0.0000 -0.0006	0.8770
1.0000	+0.0000 -0.0002	N/A	-0.0003 -0.0006	+0.0000 -0.0003	+0.0000 -0.0006	1.0020
1.2500	+0.0000 -0.0004	N/A	-0.0003 -0.0007	+0.0000 -0.0004	+0.0000 -0.0008	1.2525
1.5000	+0.0000 -0.0004	N/A	-0.0003 -0.0007	+0.0000 -0.0004	+0.0000 -0.0008	1.5025
1.7500	N/A	+0.0000 -0.0003	-0.0004 -0.0009	+0.0000 -0.0005	+0.0000 -0.0008	1.7525
2.0000	N/A	+0.0000 -0.0003	-0.0004 -0.0009	+0.0000 -0.0005	+0.0000 -0.0008	2.0025
2.5000	N/A	+0.0000 -0.0003	-0.0006 -0.0011	+0.0000 -0.0005	+0.0000 -0.0008	2.5025
3.0000	N/A	+0.0000 -0.0003	-0.0006 -0.0012	+0.0000 -0.0006	+0.0000 -0.0008	3.0025
3.7500	N/A	N/A	-0.0008 -0.0014	+0.0000 -0.0006	+0.0000 -0.0010	3.7525
4.5000	N/A	N/A	-0.0008 -0.0014	+0.0000 -0.0006	+0.0000 -0.0010	4.5025

Guide Pins – Pressed Fit

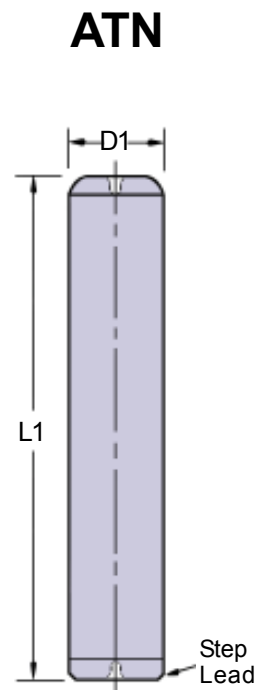
GUIDE PIN- STRAIGHT					
PART NUMBER	D1	L1	PART NUMBER	D1	L1
TN-750-X-4	3/4"	4	TN-125-X-7	1-1/4"	7
TN-750-X-4-1/2		4-1/2	TN-125-X-7-1/2		7-1/2
TN-750-X-5		5	TN-125-X-8		8
TN-750-X-6		6	TN-125-X-8-1/2		8-1/2
TN-750-X-7		7	TN-125-X-9		9
TN-750-X-8		8	TN-125-X-9-1/2		9-1/2
TN-100-X-4		1"	4		TN-125-X-10	1-1/2"	10
TN-100-X-4-1/2	4-1/2		TN-125-X-11	11	
TN-100-X-5	5		TN-125-X-12	12	
TN-100-X-5-1/2	5-1/2		TN-150-X-5	5	
TN-100-X-6	6		TN-150-X-5-1/2	5-1/2	
TN-100-X-6-1/2	6-1/2		TN-150-X-6	6	
TN-100-X-7	7		TN-150-X-6-1/2	6-1/2	
TN-100-X-7-1/2	7-1/2	TN-150-X-7	7		
TN-100-X-8	8	TN-150-X-7-1/2	7-1/2		
TN-100-X-8-1/2	8-1/2	TN-150-X-8	8		
TN-100-X-9	9	TN-150-X-8-1/2	8-1/2		
TN-100-x-10	10	TN-150-X-9	9		
TN-125-X-4-1/2	1-1/4"	4-1/2	TN-150-X-9-1/2	1-1/2"	9-1/2
TN-125-X-5		5	TN-150-X-10		10
TN-125-X-5-1/2		5-1/2	TN-150-X-11		11
TN-125-X-6		6	TN-150-X-12		12
TN-125-X-6-1/2		6-1/2			

GUIDE PIN – STRAIGHT with Step Lead					
PART NUMBER	D1	L1	PART NUMBER	D1	L1
ATN-175-X-6	1-3/4"	6	ATN-200-X-12	2"	12
ATN-175-X-6-1/2		6-1/2	ATN-200-X-13		13
ATN-175-X-7		7	ATN-200-X-14		14
ATN-175-X-7-1/2		7-1/2	ATN-200-X-15		15
ATN-175-X-8		8	ATN-250-X-8		2-1/2"	8
ATN-175-X-8-1/2		8-1/2	ATN-250-X-8-1/2	8-1/2	
ATN-175-X-9		9	ATN-250-X-9	9	
ATN-175-X-9-1/2		9-1/2	ATN-250-X-9-1/2	9-1/2	
ATN-175-X-10		10	ATN-250-X-10	10	
ATN-175-X-11		11	ATN-250-X-11	11	
ATN-175-X-12		12	ATN-250-X-12	12	
ATN-175-X-13		13	ATN-250-X-13	13	
ATN-175-X-14		14	ATN-250-X-14	14	
ATN-175-X-15		15	ATN-250-X-15	15	
ATN-200-X-6		2"	6	ATN-300-X-9	3"	9
ATN-200-X-6-1/2	6-1/2		ATN-300-X-10	10	
ATN-200-X-7	7		ATN-300-X-11	11	
ATN-200-X-7-1/2	7-1/2		ATN-300-X-12	12	
ATN-200-X-8	8		ATN-300-X-13	13	
ATN-200-X-8-1/2	8-1/2		ATN-300-X-14	14	
ATN-200-X-9	9		ATN-300-X-15	15	
ATN-200-X-10	10		ATN-300-X-17	17	
ATN-200-X-10.5	10-1/2		ATN-300-X-19	19	
ATN-200-X-11	11		ATN-300-X-21	21	

TN and ATN pins are made of hardened steel with a precision-ground running diameter (D1), these guide pins are perfect mates for standard Lamina guide bushings.



TN pins are centerless ground.



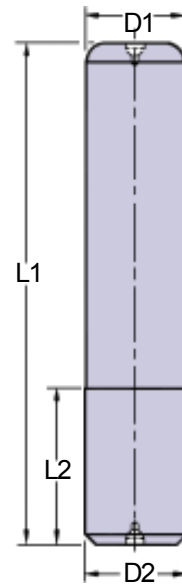
ATN pins are ground on centers.

Please see bore size information on page 18.

GUIDE PIN – STRAIGHT – PRESS FIT END UNGROUND							
PART NUMBER	D1	L1	L2	PART NUMBER	D1	L1	L2
TPB-750-X-4	3/4"	4	1-3/8"	TPB-175-X-6	1-3/4"	6	2-1/4"
TPB-750-X-4-1/2		4-1/2		TPB-175-X-6-1/2		6-1/2	
TPB-750-X-5		5		TPB-175-X-7		7	
TPB-750-X-5-1/2		5-1/2		TPB-175-X-7-1/2		7-1/2	
TPB-750-X-6		6		TPB-175-X-8		8	
TPB-750-X-7		7		TPB-175-X-8-1/2		8-1/2	
TPB-750-X-7-1/2		7-1/2		TPB-175-X-9		9	
TPB-750-X-8		8		TPB-175-X-9-1/2		9-1/2	
TPB-100-X-4	1"	4	1-1/2"	TPB-175-X-10	2"	10	2-1/2"
TPB-100-X-4-1/2		4-1/2		TPB-175-X-11		11	
TPB-100-X-5		5		TPB-175-X-12		12	
TPB-100-X-5-1/2		5-1/2		TPB-175-X-13		13	
TPB-100-X-6		6		TPB-175-X-14		14	
TPB-100-X-6-1/2		6-1/2		TPB-175-X-15		15	
TPB-100-X-7		7		TPB-175-X-17		17	
TPB-100-X-7-1/2		7-1/2		TPB-200-X-6		6	
TPB-100-X-8		8		TPB-200-X-6-1/2		6-1/2	
TPB-100-X-8-1/2		8-1/2		TPB-200-X-7		7	
TPB-100-X-9	9	TPB-200-X-7-1/2	7-1/2				
TPB-100-X-10	10	TPB-200-X-8	8				
TPB-125-X-4	1-1/4"	4	1-3/4"	TPB-200-X-8-1/2	2"	8-1/2	2-1/2"
TPB-125-X-4-1/2		4-1/2		TPB-200-X-9		9	
TPB-125-X-5		5		TPB-200-X-9-1/2		9-1/2	
TPB-125-X-5-1/2		5-1/2		TPB-200-X-10		10	
TPB-125-X-6		6		TPB-200-X-11		11	
TPB-125-X-6-1/2		6-1/2		TPB-200-X-12		12	
TPB-125-X-7		7		TPB-200-X-13		13	
TPB-125-X-7-1/2		7-1/2		TPB-200-X-14		14	
TPB-125-X-8		8		TPB-200-X-15		15	
TPB-125-X-8-1/2		8-1/2		TPB-200-X-17		17	
TPB-125-X-9	9	TPB-200-X-19	19				
TPB-125-X-9-1/2	9-1/2	TPB-250-X-8	8				
TPB-125-X-10	10	TPB-250-X-8-1/2	8-1/2				
TPB-125-X-11	11	TPB-250-X-9	9				
TPB-125-X-12	12	TPB-250-X-10	10				
TPB-150-X-4-1/2	1-1/2"	4-1/2	2"	TPB-250-X-11	2-1/2"	11	3-1/2"
TPB-150-X-5		5		TPB-250-X-12		12	
TPB-150-X-5-1/2		5-1/2		TPB-250-X-13		13	
TPB-150-X-6		6		TPB-250-X-14		14	
TPB-150-X-6-1/2		6-1/2		TPB-250-X-15		15	
TPB-150-X-7		7		TPB-250-X-17		17	
TPB-150-X-7-1/2		7-1/2		TPB-250-X-19		19	
TPB-150-X-8		8		TPB-250-X-21		21	
TPB-150-X-8-1/2		8-1/2		TPB-300-X-9		9	
TPB-150-X-9		9		TPB-300-X-10		10	
TPB-150-X-9-1/2	9-1/2	TPB-300-X-11	11				
TPB-150-X-10	10	TPB-300-X-12	12				
TPB-150-X-11	11	TPB-300-X-13	13				
TPB-150-X-12	12	TPB-300-X-14	14				
TPB-150-X-13	13	TPB-300-X-15	15				
TPB-150-X-14	14	TPB-300-X-17	17				
TPB-150-X-15	15	TPB-300-X-19	19				
TPB-150-X-18	18	TPB-300-X-21	21				

Guide Pins – Pressed Fit

TPB



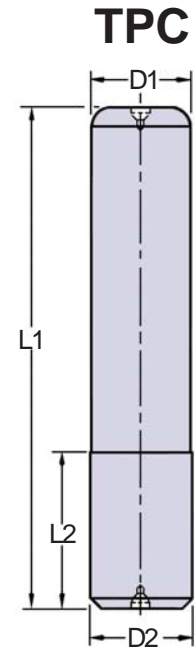
All TPB Guide Pins have centers & .015 stock left on the D2 diameter for grinding.

See bore size information on page 18.

PART NUMBER	TPB-375-X
3-3/4" diameters	
L1 & L2 lengths as specified	
PART NUMBER	TPB-450-X
4-1/2" diameters	
L1 & L2 lengths as specified	
Call for quotation on pins above.	

GUIDE PIN STRAIGHT – PRESS FIT GROUND

PART NUMBER	D1	L1	L2	PART NUMBER	D1	L1	L2	PART NUMBER	D1	L1	L2
TPC-750-X-4	3/4"	4	1-3/8"	TPC-150-X-8	1-1/2"	8	2"	TPC-300-X-9	3"	9	4"
TPC-750-X-4-1/2		4-1/2		TPC-150-X-8-1/2		8-1/2		TPC-300-X-10		10	
TPC-750-X-5		5		TPC-150-X-9		9		TPC-300-X-11		11	
TPC-750-X-5-1/2		5-1/2		TPC-150-X-9-1/2		9-1/2		TPC-300-X-12		12	
TPC-750-X-6		6		TPC-150-X-10		10		TPC-300-X-13		13	
TPC-750-X-6-1/2		6-1/2		TPC-150-X-11		11		TPC-300-X-14		14	
TPC-750-X-7		7		TPC-150-X-12		12		TPC-300-X-15		15	
TPC-750-X-7-1/2		7-1/2		TPC-175-X-6		6		TPC-300-X-17		17	
TPC-750-X-8	7/8	8	1-1/2"	TPC-175-X-6-1/2	1-3/4"	6-1/2	2-1/4"	TPC-300-X-19	3"	19	4"
TPC-875-X-4		4		TPC-175-X-7		7		TPC-300-X-21		21	
TPC-875-X-4-1/2		4-1/2		TPC-175-X-7-1/2		7-1/2					
TPC-875-X-5		5		TPC-175-X-8		8					
TPC-875-X-5-1/2		5-1/2		TPC-175-X-8-1/2		8-1/2					
TPC-875-X-6		6		TPC-175-X-9		9					
TPC-875-X-6-1/2		6-1/2		TPC-175-X-9-1/2		9-1/2					
TPC-875-X-7		7		TPC-175-X-10		10					
TPC-875-X-7-1/2	7-1/2	TPC-175-X-11	11								
TPC-875-X-8	1"	8	1-1/2"	TPC-175-X-12	2"	12	2-1/2"		3"		4"
TPC-100-X-4		4		TPC-175-X-13		13					
TPC-100-X-4-1/2		4-1/2		TPC-175-X-14		14					
TPC-100-X-5		5		TPC-175-X-15		15					
TPC-100-X-5-1/2		5-1/2		TPC-175-X-17		17					
TPC-100-X-6		6		TPC-200-X-6		6					
TPC-100-X-6-1/2		6-1/2		TPC-200-X-6-1/2		6-1/2					
TPC-100-X-7		7		TPC-200-X-7		7					
TPC-100-X-7-1/2	7-1/2	TPC-200-X-7-1/2	7-1/2								
TPC-100-X-8	1-1/4"	8	1-3/4"	TPC-200-X-8	2-1/2"	8	3-1/2"		3"		4"
TPC-100-X-8-1/2		8-1/2		TPC-200-X-8-1/2		8-1/2					
TPC-100-X-9		9		TPC-200-X-9		9					
TPC-100-X-10		10		TPC-200-X-9-1/2		9-1/2					
TPC-125-X-4		4		TPC-200-X-10		10					
TPC-125-X-4-1/2		4-1/2		TPC-200-X-11		11					
TPC-125-X-5		5		TPC-200-X-12		12					
TPC-125-X-5-1/2		5-1/2		TPC-200-X-13		13					
TPC-125-X-6	6	TPC-200-X-14	14								
TPC-125-X-6-1/2	6-1/2	TPC-200-X-15	15								
TPC-125-X-7	1-1/2"	7	2"	TPC-200-X-17	2-1/2"	17	3-1/2"		3"		4"
TPC-125-X-7-1/2		7-1/2		TPC-200-X-19		19					
TPC-125-X-8		8		TPC-250-X-8		8					
TPC-125-X-8-1/2		8-1/2		TPC-250-X-8-1/2		8-1/2					
TPC-125-X-9		9		TPC-250-X-9		9					
TPC-125-X-9-1/2		9-1/2		TPC-250-X-10		10					
TPC-125-X-10		10		TPC-250-X-11		11					
TPC-125-X-11		11		TPC-250-X-12		12					
TPC-125-X-12	12	TPC-250-X-13	13								
TPC-150-X-4-1/2	1-1/2"	4-1/2	2"	TPC-250-X-14	2-1/2"	14	3-1/2"		3"		4"
TPC-150-X-5		5		TPC-250-X-15		15					
TPC-150-X-5-1/2		5-1/2		TPC-250-X-17		17					
TPC-150-X-6		6		TPC-250-X-19		19					
TPC-150-X-6-1/2		6-1/2		TPC-250-X-21		21					
TPC-150-X-7		7									
TPC-150-X-7-1/2		7-1/2									



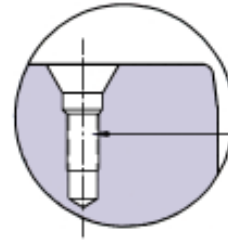
D2 Specifications:
 TPC-100 & smaller = nominal plus .0020 ^{+0.0000} _{-0.0006}
 TPC-125 - 300 = nominal plus .0025 ^{+0.0000} _{-0.0008}
 TPC-375 & 450 = nominal plus .0025 ^{+0.0000} _{-0.0010}

PART NUMBER	TPC-375-X
3-3/4" diameters	
L1 & L2 lengths as specified	
PART NUMBER	TPC-450-X
4-1/2" diameters	
L1 & L2 lengths as specified	
Call for quotation on pins above.	

Guide Pins – Pressed Fit – Metric Solid & Hollow

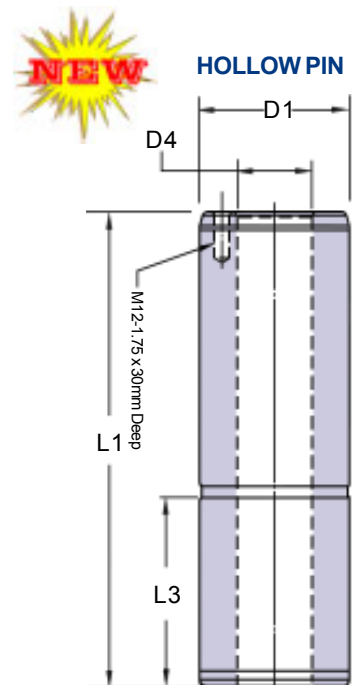
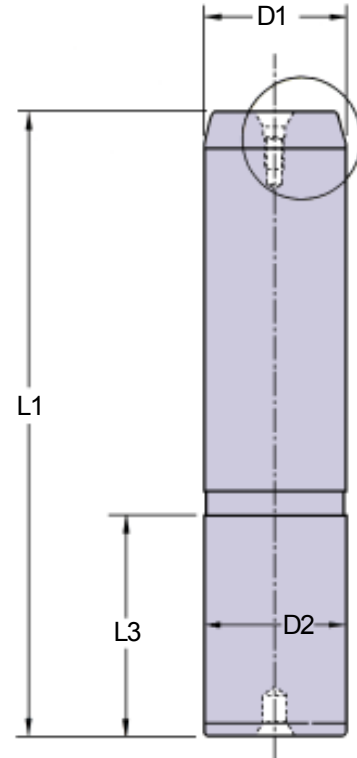
These pins are made especially for automotive stamping companies. They conform to the standards agreed to by the North American Automotive Metric Standards group.

AUTOMOTIVE METRIC
NAAMS STANDARD



32, 40, 50 & 63 Dia. guide posts have M8 x 1.25 - 12 thread; 80, 100, 115 & 125 Dia. guide posts have M12 x 1.75 - 18 thread to facilitate handling from deep freeze.

GUIDE PIN – STRAIGHT – NAAMS									
SOLID		HOLLOW	D1	D1 Tol g6	D2	D2 Tol r6	D4 Hollow Pins Only	L1	L3
PART NUMBER	PART NUMBER	PART NUMBER							
Ground	Unground	Ground							
G512512	G512512UG	N/A	25	-0.07 -0.20	25	+0.41 +0.28		125	36
G512514	G512514UG							140	
G512516	G512516UG							160	
G512518	G512518UG							180	
G513214	G513214UG	N/A	32	-0.09 -0.25	32	+0.50 +0.34		140	45
G513216	G513216UG							160	
G513218	G513218UG							180	
G513220	G513220UG							200	
G514014	G514014UG	N/A	40	-0.09 -0.25	40	+0.50 +0.34		140	56
G514016	G514016UG							160	
G514018	G514018UG							180	
G514020	G514020UG							200	
G514022	G514022UG							225	
G514025	G514025UG							250	
G515016	G515016UG	N/A	50	-0.09 -0.25	50	+0.50 +0.34		160	70
G515018	G515018UG							180	
G515020	G515020UG							200	
G515022	G515022UG							225	
G515025	G515025UG							250	
G515028	G515028UG							280	
G515031	G515031UG							315	
G516318	G516318UG	N/A	63	-0.10 -0.29	63	+0.60 +0.41		180	80
G516320	G516320UG							200	
G516322	G516322UG							225	
G516325	G516325UG							250	
G516328	G516328UG							280	
G516331	G516331UG							315	
G516335	G516335UG							355	
G516340	G516340UG							400	
G516350	G516350UG							500	
G518025	G518025UG	N/A	80	-0.10 -0.29	80	+0.62 +0.43		250	100
G518028	G518028UG							280	
G518031	G518031UG							315	
G518035	G518035UG							355	
G518040	G518040UG							400	
G518045	G518045UG							450	
G518050	G518050UG							500	
G511031	G511031UG	GH511031	100	-0.12 -0.34	100	+0.73 +0.51	50	315	125
G511035	G511035UG	GH511035						355	
G511040	G511040UG	GH511040						400	
G511045	G511045UG	GH511045						450	
G511050	G511050UG	GH511050						500	
G511055	G511055UG	GH511055						550	
G511060	G511060UG	GH511060						600	
G511065	G511065UG							650	
G511140	G511140UG	N/A	115	-0.12 -0.34	115	+0.76 +0.54		400	140
G511150	G511150UG							500	
G511235	G511235UG	GH511235	125	-0.14 -0.39	125	+0.88 +0.63	65	355	140
G511240	G511240UG	GH511240						400	
G511245	G511245UG	GH511245						450	
G511250	G511250UG	GH511250						500	
G511255	G511255UG	GH511255						550	
G511260	G511260UG	GH511260						600	
G511265	G511265UG	GH511265						650	
G511270	G511270UG							700	

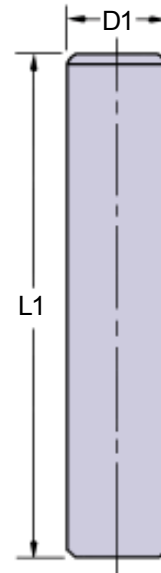


Please see bore size information on page 18.

Guide Pins – Pressed Fit – Metric

GUIDE PINS – STRAIGHT – METRIC						
PART NUMBER	D1 Nom Pin Dia	L1 LENGTH	PART NUMBER	D1 Nom Pin Dia	L1 LENGTH	
TN-19MM-X-120	19mm	120	TN-25MM-X-220	25mm	220	
TN-19MM-X-130		130	TN-25MM-X-240		240	
TN-19MM-X-140		140	TN-25MM-X-260		260	
TN-19MM-X-150		150	TN-25MM-X-280		280	
TN-19MM-X-160		160	TN-32MM-X-130		32mm	130
TN-19MM-X-170		170	TN-32MM-X-140			140
TN-19MM-X-180		180	TN-32MM-X-150			150
TN-19MM-X-190		190	TN-32MM-X-160			160
TN-19MM-X-200		200	TN-32MM-X-170			170
TN-25MM-X-120	25mm	120	TN-32MM-X-180	180		
TN-25MM-X-130		130	TN-32MM-X-190	190		
TN-25MM-X-140		140	TN-32MM-X-200	200		
TN-25MM-X-150		150	TN-32MM-X-220	220		
TN-25MM-X-160		160	TN-32MM-X-240	240		
TN-25MM-X-170		170	TN-32MM-X-260	260		
TN-25MM-X-180		180	TN-32MM-X-280	280		
TN-25MM-X-190		190	TN-32MM-X-300	300		
TN-25MM-X-200		200				

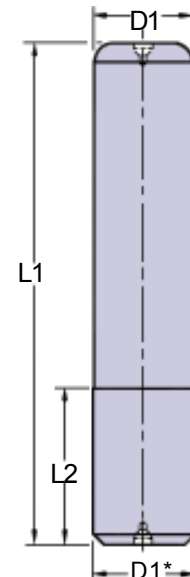
TN -Metric



TN pins are designed to be pressed into place. The ground bearing surface is equal top to bottom.

STRAIGHT GUIDE PINS – METRIC – UNGROUND							
PART NUMBER	D1	L1	L2	PART NUMBER	D1	L1	L2
TPB-40MM-X-130	40mm	130	50mm	TPB-50MM-X-260	50mm	260	60mm
TPB-40MM-X-140		140		TPB-50MM-X-280		280	
TPB-40MM-X-150		150		TPB-50MM-X-300		300	
TPB-40MM-X-160		160		TPB-50MM-X-320		320	
TPB-40MM-X-170		170		TPB-50MM-X-360		360	
TPB-40MM-X-180		180		TPB-63MM-X-200		63mm		200	80mm
TPB-40MM-X-190		190		TPB-63MM-X-220	220		
TPB-40MM-X-200		200		TPB-63MM-X-240	240		
TPB-40MM-X-220		220		TPB-63MM-X-260	260		
TPB-40MM-X-240		240		TPB-63MM-X-280	280		
TPB-40MM-X-260		260		TPB-63MM-X-300	300		
TPB-40MM-X-280		280		TPB-63MM-X-320	320		
TPB-40MM-X-300		300		TPB-63MM-X-360	360		
TPB-40MM-X-320		320		TPB-63MM-X-400	400		
TPB-40MM-X-360		360		TPB-63MM-X-440	440		
TPB-50MM-X-150		50mm		150	60mm	TPB-80MM-X-280	80mm	280	100mm
TPB-50MM-X-160	160		TPB-80MM-X-300	300			
TPB-50MM-X-170	170		TPB-80MM-X-320	320			
TPB-50MM-X-180	180		TPB-80MM-X-360	360			
TPB-50MM-X-190	190		TPB-80MM-X-400	400			
TPB-50MM-X-200	200		TPB-80MM-X-440	440			
TPB-50MM-X-220	220		TPB-80MM-X-500	500			
TPB-50MM-X-240	240						

TPB - Metric



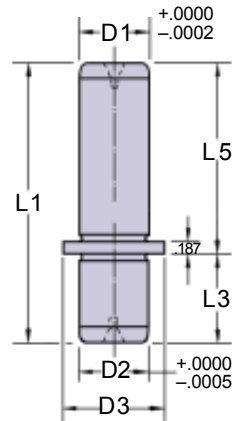
*TPB pins have grind stock on the press fit end.

Guide Pins – Tap Fit

Lamina demountable guide pins are tap fit and require toe clamps and screws to hold them in place.

The clamping flange is ground so that the flange fits squarely against the mounting surface.

Please see pages 16 & 17 for toe clamp placement information and bore size information on page 18.



Heavy-duty X-40-Clamps are used to secure the pins to the die shoe.

Clamps and screws are included.

GUIDE PINS – DEMOUNTABLE

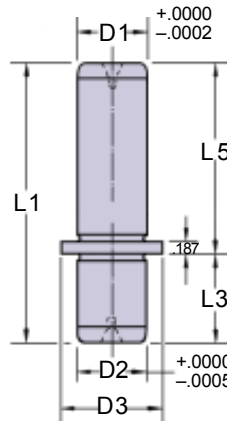
PART NUMBER	D1 & D2 Nom Pin Dia	D3 +.000 -.015	L1 ±.010	L3 ±.010	L5 (Ref)	NO. of CLAMPS	PART NUMBER	D1 & D2 Nom Pin Dia	D3 +.000 -.015	L1 ±.010	L3 ±.010	L5 (Ref)	NO. of CLAMPS								
DGP0810	1	1.313	3.688	1.188	2.500	3	DGP1032	1-1/4	1.563	9.188	1.188	8.000	3								
DGP0811			3.938		2.750		DGP1033			9.438		8.250									
DGP0812			4.188		3.000		DGP1036			10.188		9.000									
DGP0813			4.438		3.250		DGP1037			10.438		9.250									
DGP0814			4.688		3.500		DGP1040			11.188		10.000									
DGP0815			4.938		3.750		DGP1041			11.438		10.250									
DGP0816			5.188		4.000		DGP1211			4.188		2.750									
DGP0817			5.438		4.250		DGP1212			4.438		3.000									
DGP0818			5.688		4.500		DGP1213			4.688		3.250									
DGP0819			5.938		4.750		DGP1214			4.938		3.500									
DGP0820			6.188		5.000		DGP1215			5.188		3.750									
DGP0822			6.688		5.500		DGP1216			5.438		4.000									
DGP0824			7.188		6.000		DGP1217			5.688		4.250									
DGP0826			7.688		6.500		DGP1218			5.938		4.500									
DGP0828			8.188		7.000		DGP1219			6.188		4.750									
DGP0830			8.688		7.500		DGP1220			6.438		5.000									
DGP0832			9.188		8.000		DGP1221			6.688		5.250									
DGP1011			1-1/4		1.563		3.938			1.188		2.750		3	DGP1222	1-1/2	1.875	6.938	1.438	5.500	3
DGP1012							4.188					3.000			DGP1223			7.188		5.750	
DGP1013							4.438					3.250			DGP1224			7.438		6.000	
DGP1014	4.688	3.500		DGP1225		7.688	6.250														
DGP1015	4.938	3.750		DGP1226		7.938	6.500														
DGP1016	5.188	4.000		DGP1227		8.188	6.750														
DGP1017	5.438	4.250		DGP1228		8.438	7.000														
DGP1018	5.688	4.500		DGP1229		8.688	7.250														
DGP1019	5.938	4.750		DGP1230		8.938	7.500														
DGP1020	6.188	5.000		DGP1232		9.438	8.000														
DGP1021	6.438	5.250		DGP1233		9.688	8.250														
DGP1022	6.688	5.500		DGP1236		10.438	9.000														
DGP1023	6.938	5.750		DGP1237		10.688	9.250														
DGP1024	7.188	6.000		DGP1240		11.438	10.000														
DGP1025	7.438	6.250		DGP1241		11.688	10.250														
DGP1026	7.688	6.500		DGP1414		5.188	3.500														
DGP1027	7.938	6.750		DGP1416		5.688	4.000														
DGP1028	8.188	7.000		DGP1417		5.938	4.250														
DGP1029	8.438	7.250		DGP1418		6.188	4.500														
DGP1030	8.688	7.500		DGP1419		6.438	4.750														

Guide Pins – Tap Fit

Lamina demountable guide pins are tap fit and require toe clamps and screws to hold them in place.

The clamping flange is ground so that the flange fits squarely against the mounting surface.

Please see pages 16 & 17 for toe clamp placement information and bore size information on page 18.



Heavy-duty X-40-Clamps are used to secure the pins to the die shoe.

Clamps and screws are included.

GUIDE PINS – DEMOUNTABLE													
PART NUMBER	D1 & D2 Nom Pin Dia	D3 +.000 -.015	L1 ±.010	L3 ±.010	L5 (Ref)	NO. of CLAMPS	PART NUMBER	D1 & D2 Nom Pin Dia	D3 +.000 -.015	L1 ±.010	L3 ±.010	L5 (Ref)	NO. of CLAMPS
DGP1420	1-3/4	2.250	6.688	1.688	5.000	4	DGP2022	2-1/2	3.031	7.438	1.938	5.500	4
DGP1422			7.188		5.500		DGP2024			7.938		6.000	
DGP1424			7.688		6.000		DGP2026			8.438		6.500	
DGP1426			8.188		6.500		DGP2028			8.938		7.000	
DGP1428			8.688		7.000		DGP2030			9.438		7.500	
DGP1430			9.188		7.500		DGP2032			9.938		8.000	
DGP1432			9.688		8.000		DGP2034			10.438		8.500	
DGP1434			10.188		8.500		DGP2036			10.938		9.000	
DGP1436			10.688		9.000		DGP2038			11.438		9.500	
DGP1438			11.188		9.500		DGP2040			11.938		10.000	
DGP1440			11.688		10.000		DGP2042			12.438		10.500	
DGP1446			13.188		11.500		DGP2048			13.938		12.000	
DGP1448			13.688		12.000		DGP2054			15.438		13.500	
DGP1614			2		2.500		5.438			1.938		3.500		4	DGP2056	3	3.500	15.938	2.438	14.000	4
DGP1616	5.938	4.000		DGP2064		17.938	16.000						
DGP1617	6.188	4.250		DGP2066		18.438	16.500						
DGP1618	6.438	4.500		DGP2418		6.938	4.500						
DGP1619	6.688	4.750		DGP2420		7.438	5.000						
DGP1620	6.938	5.000		DGP2422		7.938	5.500						
DGP1622	7.438	5.500		DGP2424		8.438	6.000						
DGP1624	7.938	6.000		DGP2426		8.938	6.500						
DGP1626	8.438	6.500		DGP2428		9.438	7.000						
DGP1628	8.938	7.000		DGP2430		9.938	7.500						
DGP1630	9.438	7.500		DGP2432		10.438	8.000						
DGP1632	9.938	8.000		DGP2434		10.938	8.500						
DGP1634	10.438	8.500		DGP2436		11.438	9.000						
DGP1636	10.938	9.000		DGP2438		11.938	9.500						
DGP1638	11.438	9.500		DGP2440		12.438	10.000						
DGP1640	11.938	10.000		DGP2442		12.938	10.500						
DGP1642	12.438	10.500		DGP2448		14.438	12.000						
DGP1646	13.438	11.500		DGP2454		15.938	13.500						
DGP1648	13.938	12.000		DGP2456		16.438	14.000						
DGP1656	15.938	14.000		DGP2464		18.438	16.000						
DGP1658	16.438	14.500		DGP2466		18.938	16.500						
DGP1670	19.438	17.500											
DGP2018	2-1/2	3.031	6.438	1.938	4.500	4							
DGP2020			6.938		5.000								

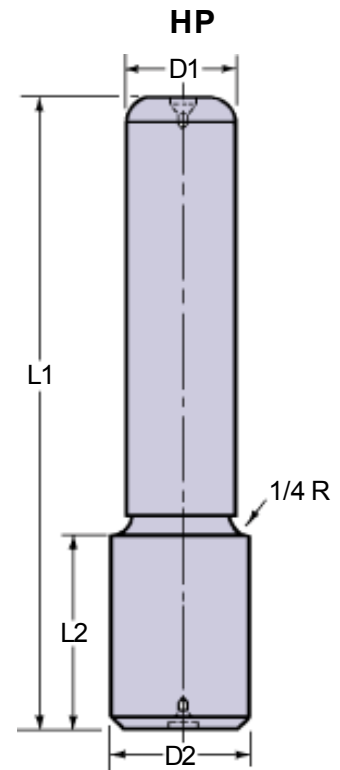
Guide Pins – Pressed Fit

Shoulder type guide pins are for use with automotive, hardware, forming, or draw dies where stamping stock is thicker than 1/16", and clearances between punch and die sections will be more than .003" per side.

Shoulder type guide pins are also valuable for repair of damaged dies where straight type pins no longer fit.

(Pins available in Class 2)

GUIDE PINS – WITH SHOULDERS															
PART NUMBER	D1 Nom Pin Dia.	D2 Press Dia.	L1 LENGTH	L2	PART NUMBER	D1 Nom Pin Dia.	D2 Press Dia.	L1 LENGTH	L2						
HP-100-X-5-1/2	1"	1-1/2"	5-1/2	1-1/2"	HP-200-X-8	2"	2-1/2"	8	3-1/2"						
HP-100-X-6			6		HP-200-X-8-1/2			8-1/2							
HP-100-X-6-1/2			6-1/2		HP-200-X-9			9							
HP-100-X-7			7		HP-200-X-10			10							
HP-100-X-8			8		HP-200-X-11			11							
HP-100-X-9			9		HP-200-X-12			12							
HP-125-X-6	1-1/4"	1-3/4"	6	2	HP-200-X-13	2-1/2"	3"	13	4"						
HP-125-X-7			7		HP-200-X-14			14							
HP-125-X-7-1/2			7-1/2		HP-200-X-15			15							
HP-125-X-8			8		HP-200-X-17			17							
HP-125-X-9			9		HP-250-X-9			9							
HP-150-X-6			1-1/2"		2"			6		2-1/2"	HP-250-X-10	2-1/2"	3"	10	5"
HP-150-X-6-1/2	6-1/2	HP-250-X-11		11											
HP-150-X-7	7	HP-250-X-12		12											
HP-150-X-7-1/2	7-1/2	HP-250-X-13		13											
HP-150-X-8	8	HP-250-X-14		14											
HP-150-X-8-1/2	8-1/2	HP-250-X-15		15											
HP-150-X-9	9	HP-250-X-17		17											
HP-150-X-10	10	HP-300-X-11		11											
HP-150-X-11	11	HP-300-X-12		12											
HP-150-X-12	12	HP-300-X-14		14											
HP-150-X-13	13	HP-300-X-15		15											
HP-150-X-14	14	HP-300-X-17		17											
HP-175-X-7-1/2	1-3/4"	2-1/4"		7-1/2		3"	HP-300RA-X-11	3"	3-1/2"		11			5"	
HP-175-X-8				8			HP-300RA-X-12				12				
HP-175-X-9			9	HP-300RA-X-13	13										
HP-175-X-10			10	HP-300RA-X-14	14										
HP-175-X-11			11	HP-300RA-X-15	15										
HP-175-X-12			12	HP-300RA-X-17	17										
HP-175-X-13			13	HP Pins can be manufactured in 3 ^{3/4} " and 4 ^{1/2} " diameters in various lengths. See page 22.											
HP-175-X-14			14												



D2 dimension is supplied with approximately .016" grindstock.

HP Shoulder pins are meant to be press fit into place.

Guide Pins – Tap Fit – Metric

Lamina has a wide variety of pins to meet most tool room requirements.

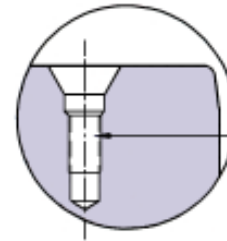
Applications:

- Transfer Presses
- Repairs

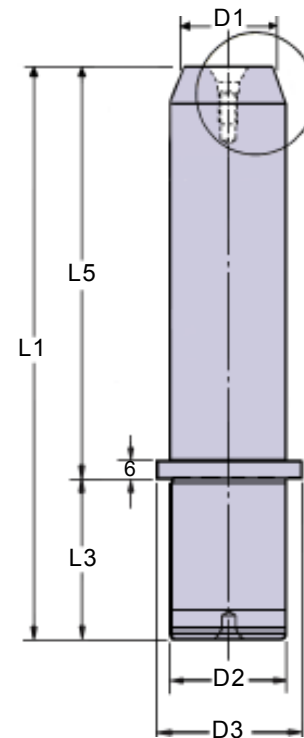
*AUTOMOTIVE METRIC
NAAMS STANDARD*

See page 17 for clamp placement instructions.

GUIDE PINS WITH SHOULDERS – METRIC								
PART NUMBER	D1	D1 Tol g6	D2	D2 Tol r6	D3	L1	L3	L5
G503214	32	-0.009 -0.025	32	+0.050 +0.034	40	140	45	95
G503216						160		115
G503218						180		135
G503220						200		155
G504016	40	-0.009 -0.025	40	+0.050 +0.034	50	160	56	104
G504018						180		124
G504020						200		144
G504022						225		169
G504025						250		194
G505016	50	-0.009 -0.025	50	+0.050 +0.034	63	160	70	90
G505018						180		110
G505020						200		130
G505022						225		155
G505025						250		180
G505028						280		210
G505031						315		245
G506320	63	-0.010 -0.029	63	+0.060 +0.041	80	200	80	120
G506322						225		145
G506325						250		170
G506328						280		200
G506331						315		235
G506335						355		275
G506340	400	320						
G508025	80	-0.010 -0.029	80	+0.062 +0.043	100	250	100	150
G508028						280		180
G508031						315		215
G508035						355		255
G508040						400		300
G501031	100	-0.012 -0.034	100	+0.073 +0.051	125	315	125	190
G501035						355		230
G501040						400		275



32, 40, 50 & 63 Dia. guide posts have M8 x 1.25 -12 thread; 80, 100, 115 & 125 Dia. guide posts have M12 x 1.75 - 18 thread to facilitate handling from deep freeze.



Must be held in place with toe clamps. G720000C toe clamps & screws are included.

See pages 16 & 17 for clamping information; bore size information on page 18.



GUIDE PIN – REMOVABLE							
PART NUMBER	D1 Nom. Pin Dia	L1 LENGTH	L2	Tapped Hole			
RP-100-X-5	1.0000" ±.0001 -.0001	5.000	1.500	Pin End 5/16-18x3/4 Install End 5/16-18			
RP-100-X-5-1/2		5.500					
RP-100-X-6		6.000					
RP-100-X-6-1/2		6.500					
RP-100-X-7		7.000					
RP-100-X-7-1/2		7.500					
RP-100-X-8		8.000					
RP-100-X-8-1/2		8.500					
RP-100-X-9		9.000					
RP-125-X-5-1/2	1.2500" ±.0001 -.0002	5.500	1.750	Pin End 5/16-18x7/8 Install End 3/8-16			
RP-125-X-6		6.000					
RP-125-X-6-1/2		6.500					
RP-125-X-7		7.000					
RP-125-X-7-1/2		7.500					
RP-125-X-8		8.000					
RP-125-X-8-1/2		8.500					
RP-125-X-9		9.000					
RP-125-X-10		10.000					
RP-125-X-11		11.000					
RP-125-X-12		12.000					
RP-125-X-13	13.000						
RP-125-X-14	14.000						
RP-150-X-5-1/2	1.5000" ±.0001 -.0002	5.500	2.000	Pin End 3/8-16x1 Install End 3/8-16			
RP-150-X-6		6.000					
RP-150-X-6-1/2		6.500					
RP-150-X-7		7.000					
RP-150-X-7-1/2		7.500					
RP-150-X-8		8.000					
RP-150-X-8-1/2		8.500					
RP-150-X-9		9.000					
RP-150-X-10		10.000					
RP-175-X-7		1.7500" ±.0001 -.0002			7.000	2.250	Pin End 3/8-16x1 Install End 3/8-16
RP-175-X-7-1/2	7.500						
RP-175-X-8	8.000						
RP-175-X-8-1/2	8.500						
RP-175-X-9	9.000						
RP-175-X-10	10.000						
RP-200-X-6	2.0000" ±.0001 -.0003	6.000	2.500	Pin End 3/8-16x7/8 Install End 3/8-16			
RP-200-X-7		7.000					
RP-200-X-7-1/2		7.500					
RP-200-X-8		8.000					
RP-200-X-8-1/2		8.500					
RP-200-X-9		9.000					
RP-200-X-10		10.000					
RP-200-X-11		11.000					
RP-200-X-12		12.000					
RP-200-X-13		13.000					
RP-200-X-14		14.000					
RP-250-X-9		2.5000" ±.0001 -.0003			9.000	3.500	Pin End 1/2-13x1 Pin End 1/2-13
RP-250-X-10					10.000		
RP-250-X-11					11.000		
RP-250-X-12	12.000						
RP-250-X-13	13.000						
RP-250-X-14	14.000						
RP-300-x-	3.0000"	Non-Stock; call for quotation					

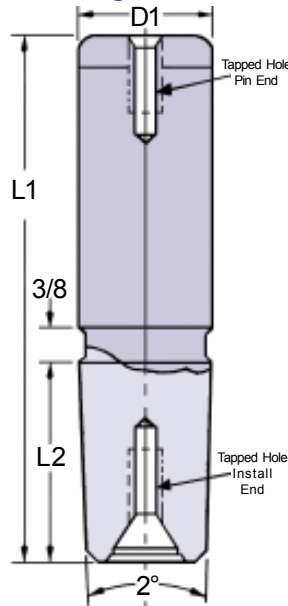
Guide Pins – Removable

Pressed Fit Bushing Liner

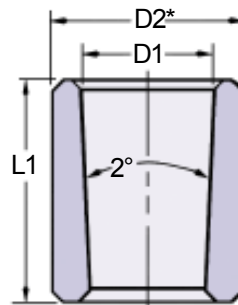
Designed specifically for all dies where it is desirable to remove pins for ease and simplicity of sharpening die.

Lamina removable pins are generally used with carbide dies, progressive dies, lamination dies, and dies for very thin materials where clearances between punch and die sections will be no more than .0007" per side.

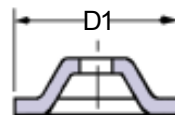
Can be used with Plain Bearing & Keyless Ball-Bearing Bushing and Retainers.



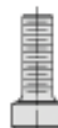
REMOVABLE PIN



BUSHING LINER



END CAP



SOCKET HEAD CAP SCREW

ASSEMBLIES for REMOVABLE PIN		
PART NUMBER Ground	PART NUMBER Unground	Nom. Pin Dia.
GRP-100-ASSY	RP-100-ASSY	1.000
GRP-125-ASSY	RP-125-ASSY	1.250
GRP-150-ASSY	RP-150-ASSY	1.500
GRP-175-ASSY	RP-175-ASSY	1.750
GRP-200-ASSY	RP-200-ASSY	2.000
GRP-250-ASSY	RP-250-ASSY	2.500
GRP-300-ASSY	RP-250-ASSY	3.000

Assembly includes 1 bushing liner, 1 End Cap & 1 Socket Head Cap Screw

BUSHING LINER for REMOVABLE PIN				
PART NUMBER Ground	PART NUMBER Unground	D1 Nom. Pin Dia.	D2* O.D.	L1 Length
GNRB-100	NRB-100	1.000	1.5008 1.5006	1.625
GNRB-125	NRB-125	1.250	1.7508 1.7506	1.875
GNRB-150	NRB-150	1.500	2.0008 2.0006	2.125
GNRB-175	NRB-175	1.750	2.2508 2.2506	2.375
GNRB-200	NRB-200	2.000	2.5008 2.5006	2.625
GNRB-250	NRB-250	2.500	3.0008 3.0006	3.625
GNRB-300	NRB-300	3.000	3.5008 3.5006	4.125

*.016 stock left on this diameter on unground liner for grinding to fit bored hole in die shoe

END CAP for REMOVABLE PIN			
PART NUMBER	Nom. Pin Dia	D1 O.D.	Soc Hd Screw
RC-100-END-CAP	1.000	1.250	5/16-18x1
RC-125-END-CAP	1.250	1.500	3/8-16x1
RC-150-END-CAP	1.500	1.750	3/8-16x1
RC-175-END-CAP	1.750	2.000	3/8-16x1
RC-200-END-CAP	2.000	2.250	3/8-16x1
RC-250-END-CAP	2.500	2.750	1/2-13x1.5
RC-300-END-CAP	3.000	3.250	1/2-13x1.5

Removable pins and assemblies are sold separately.

Specials!

Give us the opportunity to quote your specials.

- Quick turnaround time on round & flat products (2 weeks on many)
- You get exact product you need
- Opportunity for innovation
- Call or e-mail for quote template

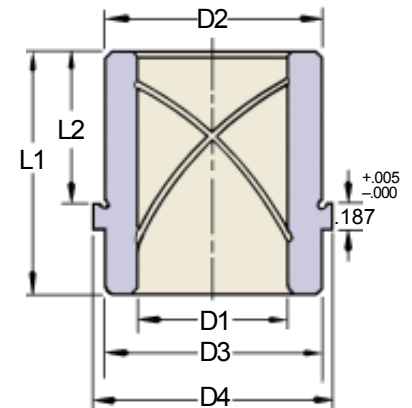


Stripper Bushings – Clamp & Pressed Fit Types

Lamina manufactures components specifically for use in dies where stripping operations take place such as in lamination dies. These components are made to “close tolerances”.

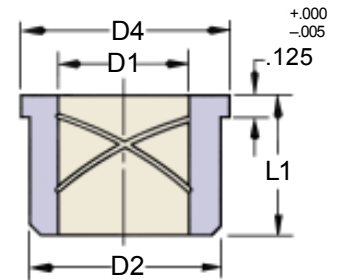
STRIPPER GUIDE PIN BUSHINGS – BRONZE PLATED										
Assembly includes bushing, clamps and screws										
PART NUMBER Ground	PART NUMBER *Unground	Nom. Pin Dia.	D1	D2	D3	D4	L1	L2	Bolt Circle Dia.	No. "D" Clamps
GCG-75	CG-75	3/4	$\frac{.7503}{.7502}$	$\frac{1.1254}{1.1252}$	1.125	1.313	1.625	1.000	1.719	2
GCG-100	CG-100	1	$\frac{1.0003}{1.0002}$	$\frac{1.3754}{1.3752}$	1.375	1.563	1.625	1.000	1.969	3

* .016" grind stock on these diameters.



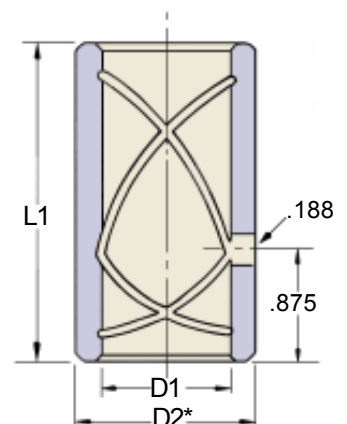
STRIPPER BUSHINGS – BRONZE PLATED PRESS FIT TYPE						
PART NUMBER Ground	PART NUMBER *Unground	Nom. Pin Dia.	D1	D2	D4 $\begin{smallmatrix} +.000 \\ -.015 \end{smallmatrix}$	L1 $\begin{smallmatrix} +.000 \\ -.031 \end{smallmatrix}$
GHG-62	HG-62	5/8	$\frac{.6253}{.6252}$	$\frac{1.0004}{1.0002}$	1.125	1
GHG-75	HG-75	3/4	$\frac{.7503}{.7502}$	$\frac{1.1254}{1.1252}$	1.250	1
GHG-100	HG-100	1	$\frac{1.0003}{1.0002}$	$\frac{1.3754}{1.3752}$	1.500	1

* .016" grind stock on these diameters.



STRIPPER BUSHING – STRAIGHT TYPE					
PART NUMBER Ground	PART NUMBER *Unground	Nom. Pin Dia.	D1	D2	L
GSG-100-L	SG-100-L	1	$\frac{1.0002}{1.0004}$	$\frac{1.3754}{1.3752}$	2.375

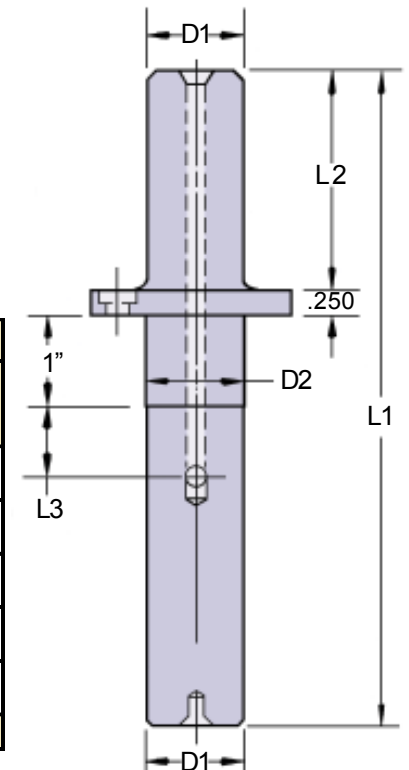
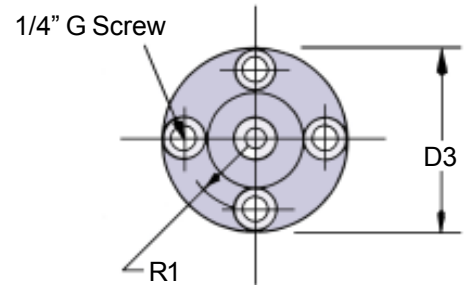
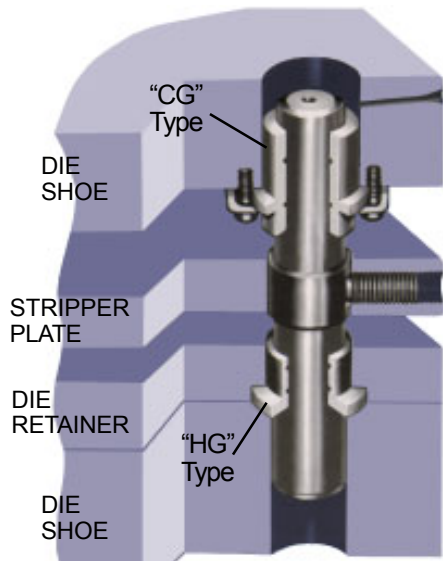
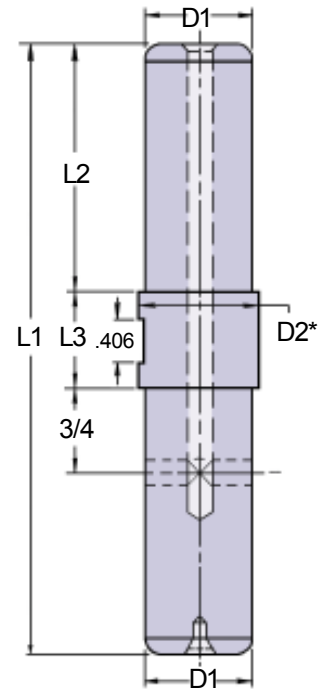
* .020" grind stock on this diameter.



Stripper Pins – Pressed Fit & Flange Types

STRIPPER PINS – PRESS FIT TYPE						
PART NUMBER	Nom. Pin Dia.	D1	D2*	L1	L2	L3
SGP-62-X-4	5/8	$\frac{.6250}{.6248}$	.640	4.00	2.25	.750
SGP-62-X-5	5/8	$\frac{.6250}{.6248}$	.640	5.00	2.25	.750
SGP-75-X-5	3/4	$\frac{.7500}{.7498}$	.765	5.00	2.25	.875
SGP-75-X-6-1/2	3/4	$\frac{.7500}{.7498}$	.765	6.50	2.75	.875
SGP-100-X-6-1/2	1	$\frac{1.0000}{0.9998}$	1.015	6.50	2.75	1.000
SGP-100-X-7-1/2	1	$\frac{1.0000}{0.9998}$	1.015	7.50	2.75	1.000

*The D2 diameter is unground. Suggested finish grind size for D2 dimension to be .001 over nominal pin diameter.



STRIPPER PIN & BUSHING APPLICATION

STRIPPER PIN – FLANGE STYLE									
PART NUMBER	Nom. Pin Dia.	D1	D2* ±.003	D3	L1	L2	L3	R1	"G" Screws
F-8890	7/8	$\frac{.8750}{.8748}$	.900	2.00	9.00	3.750	3.00	.719	Flat Head
F-1080	1	$\frac{1.0000}{0.9998}$	1.025	2.00	8.00	3.500	1.50	.750	Soc. Head
F-1085	1	$\frac{1.0000}{0.9998}$	1.025	2.00	8.50	3.500	1.50	.750	Soc. Head
F-1090	1	$\frac{1.0000}{0.9998}$	1.025	2.00	9.00	3.500	1.50	.750	Soc. Head
F-1290	1-1/4	$\frac{1.2500}{1.2498}$	1.275	2.25	9.00	3.500	1.50	.875	Soc. Head

*The D2 diameter is unground. Suggested finish bore size to be .005 over nominal pin diameter.

HEAVY DUTY STOCK LIFTERS

MODEL 75 HARDENED, GROUND AND VENTED

Rockwell: RC 52-56
Case Hardened .015 – .030 Deep

Packaged complete with spring, screw and retaining washer

When ordering please specify:

- Quantity
- Catalog Number

Lifters with travel greater than 1.75 are available. Priced on application. (Furnished without spring.)

LIFTER SPECIFICATIONS

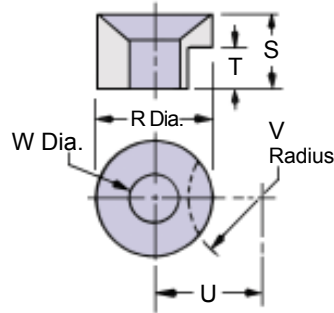
A – Operating Travel D – Pocket Depth for Spring
B – Lifter Body Length E – Spring Free Length
C – Pocket Depth for Lifter Body F – Slot Length

MODEL 75 Stock Lifter O.D. .7495"
(For Stock up to .094" thick)

PART NUMBER	A TRAVEL	B LIFTER LENGTH	C LIFTER POCKET	D SPRING POCKET	E SPRING FREE LENGTH	F SLOT LENGTH	REPLACE-MENT DIE SPRING	Lbs @1/10" SPRING DEFLECTION
75-50	0.50	2.312	2.50	2.938	2.50	1.000	M-113	4.5
75-75	0.75	2.562	2.75	3.938	3.50	1.250	M-115	3.0
75-1-0	1.00	2.812	3.00	4.938	4.50	1.500	M-115A	2.5
75-1-25	1.25	3.062	3.25	5.938	5.50	1.750	M-115B	2.1
75-1-50	1.50	3.312	3.50	6.938	6.50	2.000	M-115C	1.4
75-1-75	1.75	3.562	3.75	7.938	7.50	2.250	M-115D	1.2

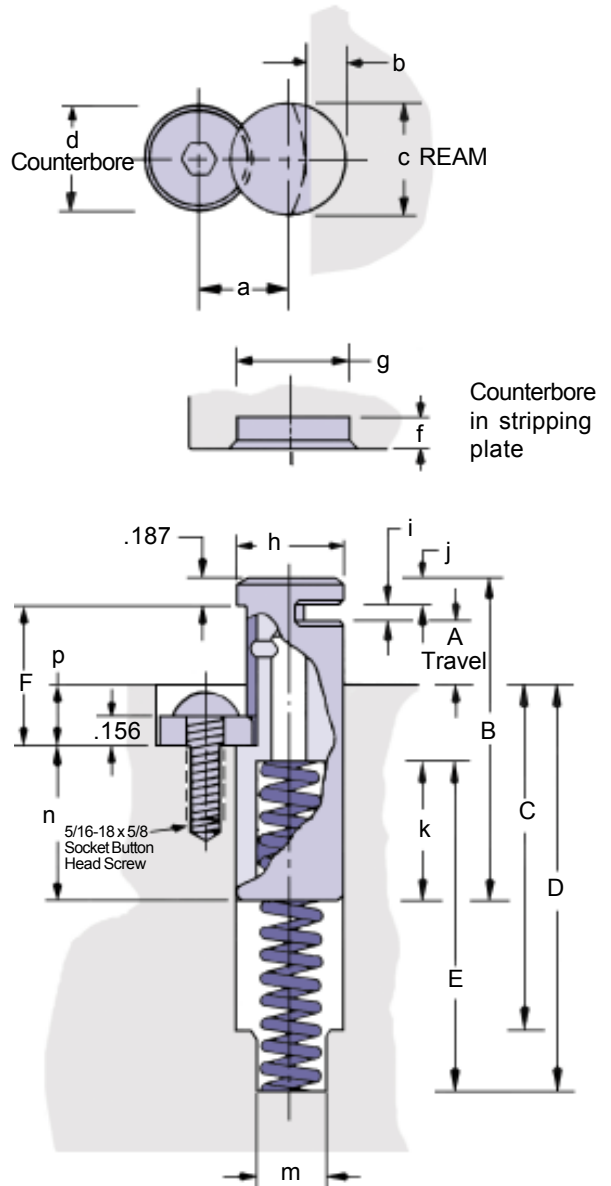
Replacement Washer – #75WASHER
Replacement Screw – #75SCREW
Die Life Package – #DL75 (6 per package)

VALUES CONSTANT FOR ALL 75 LIFTERS		
a	.578	Dimension between CL of Lifter Pocket to CL of Socket Screw
b	.203	Slot Depth ±.005
c	.750	Pocket Diameter for Lifter Body +.001 –.000
d	.688	Counter Bore Diameter for Lifter Washer
f	.25	Counter Bore Depth in Stripper Plate, minus half of stock thickness
g	.781	Counter Bore Diameter in Stripper Plate
h	.7495	Lifter Body Diameter +.0000 –.0015
i	.125	Slot Height (for Stock) ±.005
j	.187	Dimension from Top of Slot to Top of Body ±.005
k	1.000	Length of Spring Pocket in Lifter Body
m	.50	Spring Pocket Diameter
n	1.125	Dimension from Bottom of Washer (Slot) to Bottom of Body
p	.375	Counter Bore Depth for Washer & Socket Screw



PURPOSE
Available as Replacement Part No. DL75 Die Life Retaining Washer. 6 per package. Includes flat head socket screw 5/16-18x1.
Note: In blanking die sections order optional Die Life "DL" Retaining Washers: Counterbore hole must be deeper.

DIE LIFE REPLACEMENT RETAINING WASHER & SCREW KIT						
PART NUMBER	R	S	T	U	V	W
DL75	.656	.490	.280	.585	.390	.330



HEAVY DUTY STOCK LIFTERS

MODEL 112 HARDENED, GROUND AND VENTED

Rockwell: RC 52-56
Case Hardened .015 – .030 Deep

Packaged complete with spring, screw and retaining washer

When ordering please specify:

1. Quantity
2. Catalog Number

Lifters with travel greater than 1.75 are available. Priced on application. (Furnished without spring.)

LIFTER SPECIFICATIONS

- A – Operating Travel D – Pocket Depth for Spring
B – Lifter Body Length E – Spring Free Length
C – Pocket Depth for Lifter Body F – Slot Length

MODEL 112 Stock Lifter O.D. 1.1245"
(For Stock up to .156" thick)

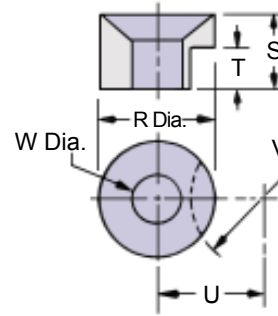
PART NUMBER	A TRAVEL	B LIFTER LENGTH	C LIFTER POCKET	D SPRING POCKET	E SPRING FREE LENGTH	F SLOT LENGTH	REPLACEMENT DIE SPRING	Lbs @1/10" SPRING DEFLECTION
112-50	0.50	2.812	2.625	3.063	2.50	1.250	M-4	12.0
112-75	0.75	3.062	2.875	4.063	3.50	1.500	M-6	8.0
112-1-0	1.00	3.312	3.125	5.063	4.50	1.750	M-8	6.4
112-1-25	1.25	3.562	3.375	6.063	5.50	2.000	M-10	5.5
112-1-50	1.50	3.812	3.625	7.063	6.50	2.250	M-11B	4.5
112-1-75	1.75	4.062	3.875	8.063	7.50	2.500	M-11C	3.8

Replacement Washer – #112 WASHER

Replacement Screw – #112 SCREW

Die Life Package – #DL112 (6 per package)

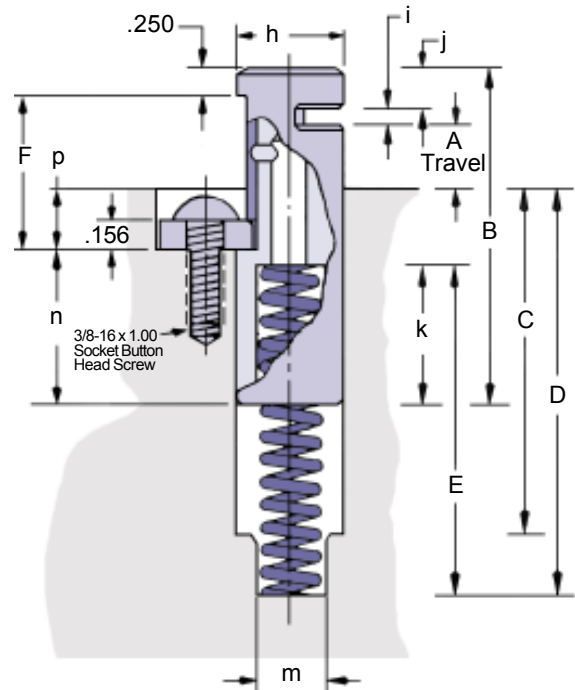
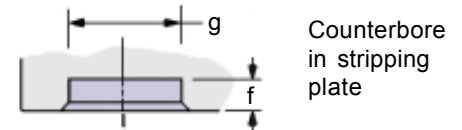
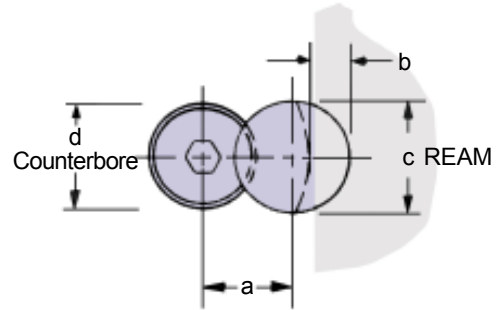
VALUES CONSTANT FOR ALL 112 LIFTERS		
a	.828	Dimension between CL of Lifter Pocket to CL of Socket Screw
b	.329	Slot Depth ±.005
c	1.125	Pocket Diameter for Lifter Body +.001 –.000
d	.875	Counter Bore Diameter for Lifter Washer
f	.50	Counter Bore Depth in Stripper Plate, minus half of stock thickness
g	1.156	Counter Bore Diameter in Stripper Plate
h	1.1245	Lifter Body Diameter +.0000 –.0015
i	.188	Slot Height (for Stock) ±.005
j	.406	Dimension from Top of Slot to Top of Body ±.005
k	1.125	Length of Spring Pocket in Lifter Body
m	.75	Spring Pocket Diameter
n	1.312	Dimension from Bottom of Washer (Slot) to Bottom of Body
p	.394	Counter Bore Depth for Washer & Socket Screw



PURPOSE

Available as Replacement Part No. DL112 Die Life Retaining Washer. 6 per package. Includes flat head socket screw 3/8-16x1-1/4. Note: In blanking die sections order optional Die Life "DL" Retaining Washers: Counterbore hole must be deeper.

DIE LIFE REPLACEMENT RETAINING WASHER & SCREW KIT						
PART NUMBER	R	S	T	U	V	W
DL112	.840	.550	.300	.830	.580	.406



HEAVY DUTY RAIL STOCK LIFTER PINS

MODEL T-750

HARDENED, GROUND AND VENTED

Rockwell: RC 52-56
Case Hardened .015 – .030 Deep

Package complete with spring, screw and retaining washer.

When ordering please specify:

1. Quantity
2. Catalog Number

LIFTER SPECIFICATIONS

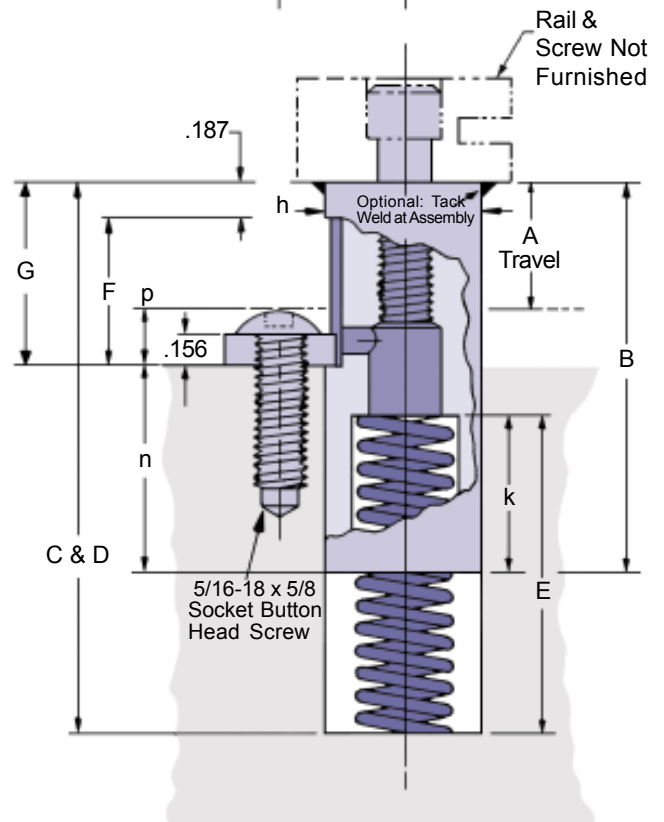
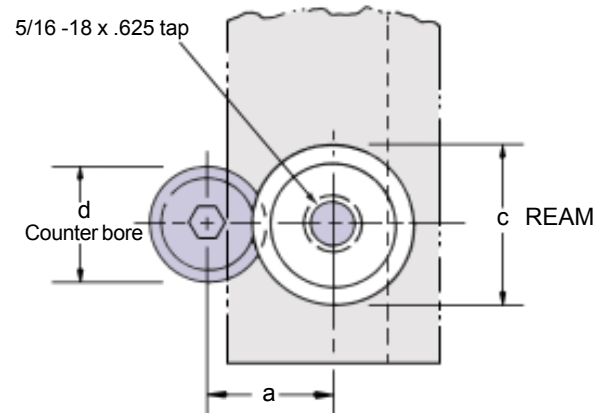
A – Operating Travel
B – Lifter Body Length
C – Pocket Depth for Lifter Body
D – Pocket Depth for Spring
E – Spring Free Length
F – Slot length
G – Top of Die to Top of Lifter Body

Rail Stock Lifter O.D. .7495" +.0000 –.0015

PART NUMBER	A TRAVEL	B LIFTER LENGTH	C & D LIFTER POCKET	G	E SPRING FREE LENGTH	F SLOT LENGTH	REPLACE-MENT DIE SPRING	Lbs @1/10" SPRING DEFLECTION
T-750-50	0.50	2.312	2.500	1.187	2.50	1.000	M-113	4.5
T-750-75	0.75	2.562	3.500	1.437	3.50	1.250	M-115	3.0
T-750-1-0	1.00	2.812	4.500	1.687	4.50	1.500	M-115A	2.5
T-750-1-25	1.25	3.062	5.500	1.937	5.50	1.750	M-115B	2.1
T-750-1-50	1.50	3.312	6.500	2.187	6.50	2.000	M-115C	1.4
T-750-1-75	1.75	3.562	7.500	2.437	7.50	2.250	M-115D	1.2

Replacement Washer Part Number – 75WASHER

Replacement Screw Part Number – 75SCREW



VALUES CONSTANT FOR ALL 75 -T LIFTERS

a	.578	Dimension between CL of Lifter Pocket to CL of Socket Screw
c	.750	Pocket Diameter for Lifter Body +.001 –.000
d	.688	Counter Bore Diameter for Lifter Washer
h	.7495	Lifter Body Diameter +.0000 –.0015
i	.125	Slot Height (for Stock) ±.005
j	.187	Dimension from Top of Slot to Top of Body ±.005
k	1.000	Length of Spring Pocket in Lifter Body
n	1.125	Dimension from Bottom of Washer (Slot) to Bottom of Body
p	.375	Counter Bore Depth for Washer & Socket Screw

HEAVY DUTY RAIL STOCK LIFTER PINS

MODEL 112T

HARDENED, GROUND AND VENTED

Rockwell: RC 52-56
Case Hardened .015 – .030 Deep

Package complete with spring, screw and retaining washer.

When ordering please specify:

1. Quantity
2. Catalog Number

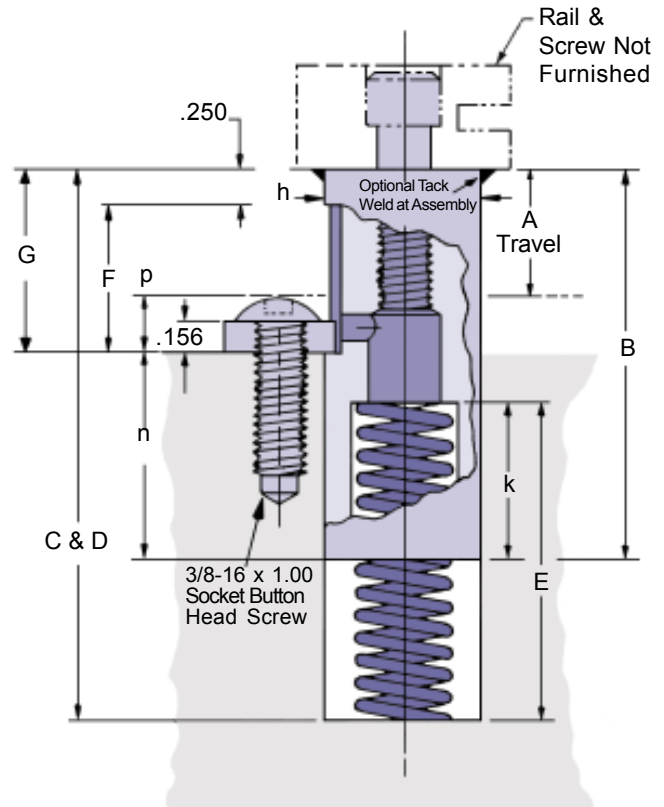
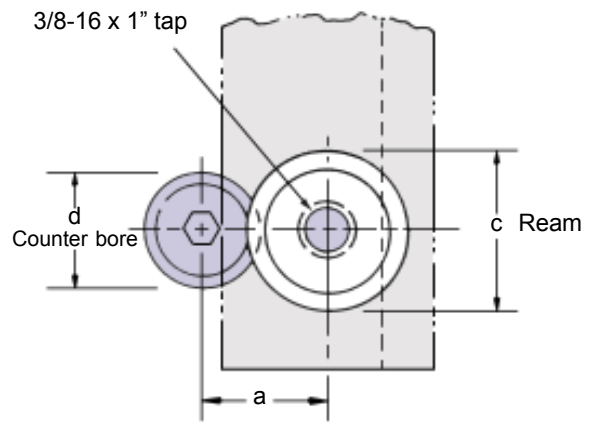
LIFTER SPECIFICATIONS

A – Operating Travel
B – Lifter Body Length
C – Pocket Depth for Lifter Body
D – Pocket Depth for Spring
E – Spring Free Length
F – Slot Length
G – Top of Die to Top of Lifter Body

Rail Stock Lifter O.D. 1.1245" +.0000 –.0015

PART NUMBER	A TRAVEL	B LIFTER LENGTH	C & D LIFTER POCKET	G	E SPRING FL.	F SLOT LENGTH	REPLACEMENT DIE SPRING	Lbs @1/10" SPRING DEFLECTION
112T-50	0.50	2.812	2.562	1.500	2.50	1.250	M-4	12.0
112T-75	0.75	3.062	3.562	1.750	3.50	1.500	M-6	8.0
112T-1-00	1.00	3.312	4.562	2.000	4.50	1.750	M-8	6.4
112T-1-25	1.25	3.562	5.562	2.250	5.50	2.000	M-10	5.5
112T-1-50	1.50	3.812	6.562	2.500	6.50	2.250	M-11B	4.5
112T-1-75	1.75	4.062	7.562	2.750	7.50	2.500	M-11C	3.8

Replacement Washer Part Number – 112WASHER
Replacement Screw Part Number – 112SCREW



VALUES CONSTANT FOR ALL 112-T LIFTERS		
a	.828	Dimension between CL of Lifter Pocket to CL of Socket Screw
c	1.125	Pocket Diameter for Lifter Body +.001 –.000
d	.875	Counter Bore Diameter for Lifter Washer
h	1.1245	Lifter Body Diameter +.0000 –.0015
i	.188	Slot Height (for Stock) ±.005
j	.406	Dimension from Top of Slot to Top of Body ±.005
k	1.125	Length of Spring Pocket in Lifter Body
n	1.312	Dimension from Bottom of Washer (Slot) to Bottom of Body
p	.394	Counter Bore Depth for Washer & Socket Screw

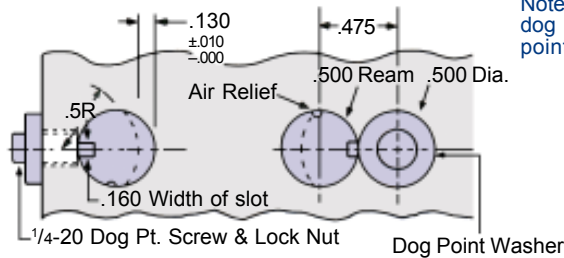
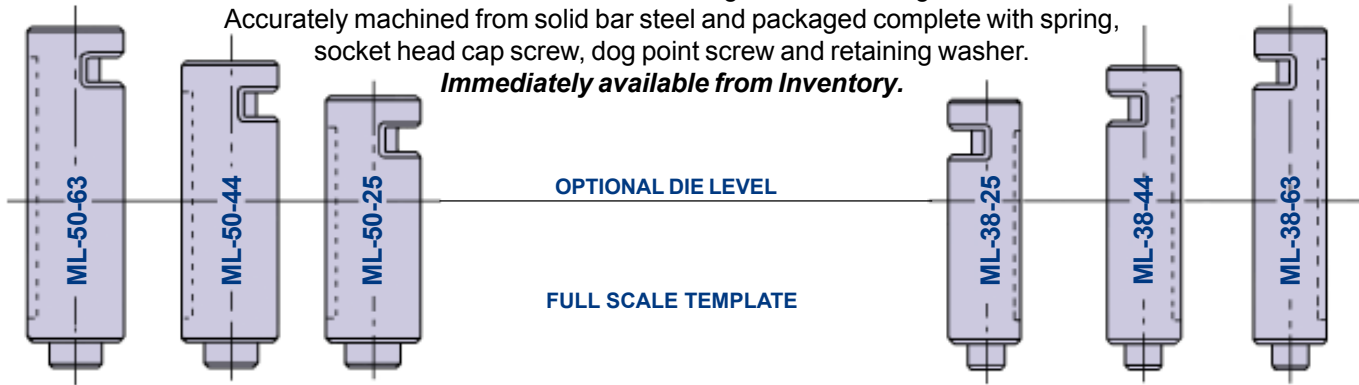
Mini-Lifters

Top or Side Mounted

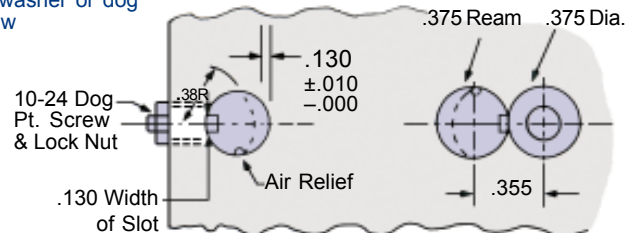
3/8" and 1/2" diameters each to 3 different lengths. Hardened, ground and vented.

Accurately machined from solid bar steel and packaged complete with spring, socket head cap screw, dog point screw and retaining washer.

Immediately available from Inventory.

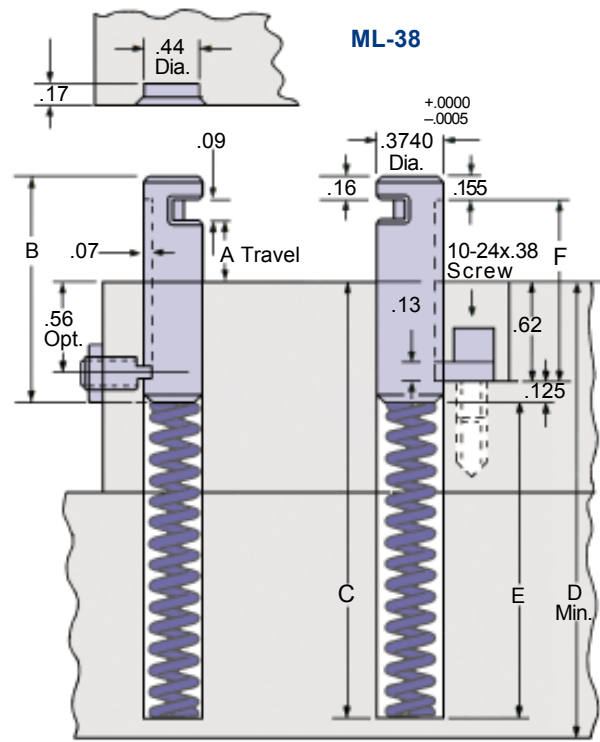
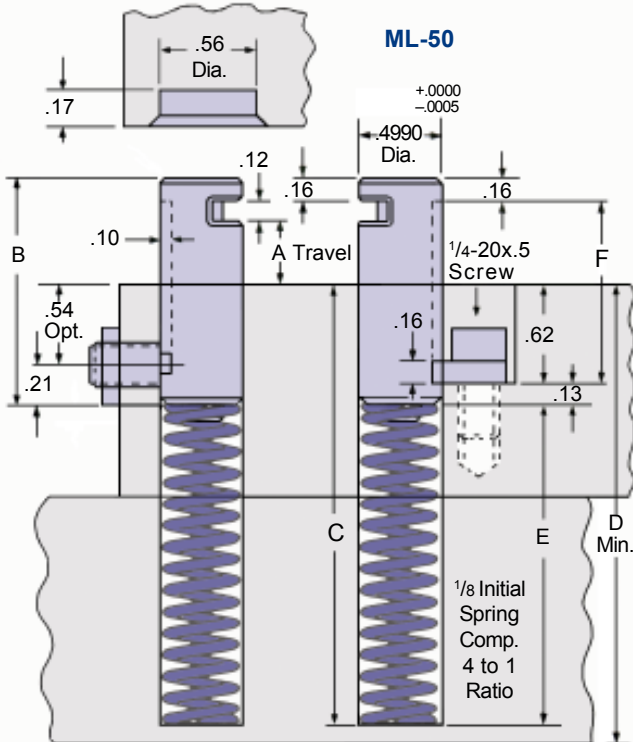


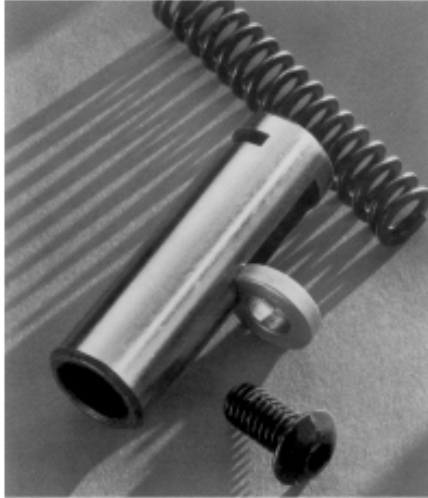
Note: Can be guided by dog point washer or dog point screw



PART NUMBER	A TRAVEL	B LENGTH	C BORE LENGTH	D MIN	E SPRING FREE LENGTH	F SLOT LENGTH	REPLACE- MENT DIE SPRING	Lbs @ 1/10" SPRING DEFLEC- TION
ML-50-25	.25	1.28	2.13	2.30	1.50	.990	M-111	6.8
ML-50-44	.44	1.47	2.63	2.80	2.00	1.180	M-112	5.5
ML-50-63	.63	1.66	3.13	3.30	2.50	1.370	M-113	4.5

PART NUMBER	A TRAVEL	B LENGTH	C BORE LENGTH	D MIN	E SPRING FREE LENGTH	F SLOT LENGTH	REPLACE- MENT DIE SPRING	Lbs @ 1/10" SPRING DEFLEC- TION
ML-38-25	.25	1.25	2.13	2.30	1.50	.970	M-101	4.0
ML-38-44	.44	1.44	2.63	2.80	2.00	1.160	M-102	2.8
ML-38-63	.63	1.63	3.13	3.30	2.50	1.350	M-103	2.4



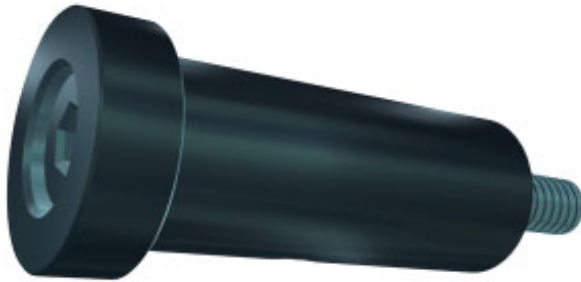


Design in (and build in) stock lifters just as easily as you do die springs and pins. Standard notched lifters are made in two sizes to handle stock up to .156" thick. Side center-rail lifters that easily accept your special rails are also offered.

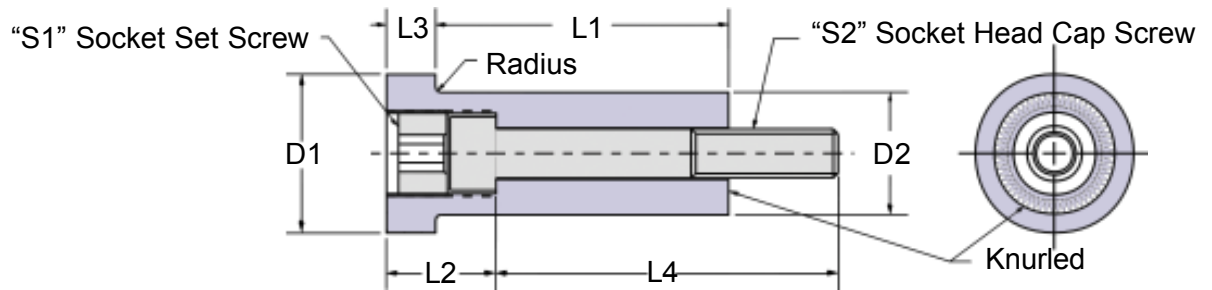
These lifters all install from the top only. Easier to do and they can be replaced without taking the die from the press. All they need are two drilled holes, one tapped. Drop the spring and lifter in the larger one and secure them with the retaining screw in the tapped hole.

Go to standard lifters for consistent quality – they're all solid bar steel, hardened, ground and vented. You can't build them yourself for less.

STOCKLIFTER REPLACEMENT PARTS				
PART NUMBER	REPLACEMENT SPRING	REPLACEMENT WASHERS	REPLACEMENT SCREW	DIE LIFE KIT 6 SETS
75-50 T-75-50	M-113	75WASHER	75SCREW	DL75
75-75 T-75-75	M-115	75WASHER	75SCREW	DL75
75-1-0 T-75-1-0	M-115A	75WASHER	75SCREW	DL75
75-1-25 T-75-1-25	M-115B	75WASHER	75SCREW	DL75
75-1-50 T-75-1-50	M-115C	75WASHER	75SCREW	DL75
75-1-75 T-75-1-75	M-115D	75WASHER	75SCREW	DL75
112-50 112T-50	M-4	112WASHER	112SCREW	DL112
112-75 112T-75	M-6	112WASHER	112SCREW	DL112
112-1-0 112T-1-00	M-8	112WASHER	112SCREW	DL112
112-1-25 112T-1-25	M-10	112WASHER	112SCREW	DL112
112-1-50 112T-1-50	M-11B	112WASHER	112SCREW	DL112
112-1-75 112T-1-75	M-11C	112WASHER	112SCREW	DL112
ML-38-25 ML-38-44 ML-38-63	M-101 M-102 M-103	38WASHER	N/A	N/A
ML-50-25 ML-50-44 ML-50-63	M-111 M-112 M-113	50WASHER	N/A	N/A



SPOOL TYPE PAD RETAINER-LOCKING



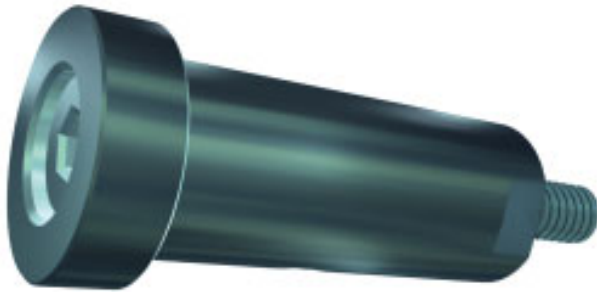
BLACK OXIDE TREATMENT

Assembly includes:
 Retainer Body
 Socket Head Cap Screw
 Socket Set Screw

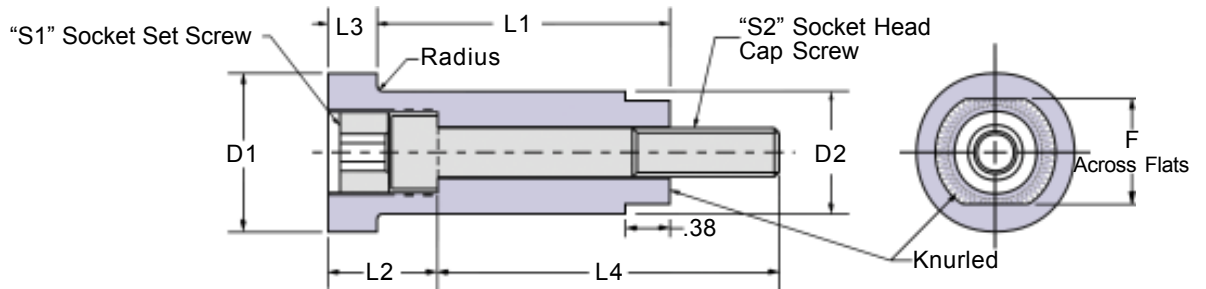
PART NUMBER	D1	D2 +.000 -.010	L2	L3	S1	S2	RADIUS	LOAD RATING LBS
PRL100	1.00	.75	1.00	.38	5/8-18	5/16-18	.03	1,500
PRL125	1.25	1.00	1.12	.50	3/4-16	3/8-16	.03	3,000
PRL162	1.62	1.25	1.12	.50	7/8-14	1/2-13	.06	5,000
PRL187	1.87	1.50	1.25	.50	1-1/8-12	5/8-11	.06	7,500
PRL200	2.00	1.62	1.38	.50	1-1/4-12	3/4-10	.06	10,000

SPOOL TYPE PAD RETAINERS – LOCKING with KNURLED SURFACE

L1 ±.005	Series PRL 100		Series PRL 125		Series PRL 162		Series PRL 187		Series PRL 200	
	PART NUMBER	L4	PART NUMBER	L4	PART NUMBER	L4	PART NUMBER	L4	PART NUMBER	L4
1.00	PRL100100	1.00	PRL125100	1.25	PRL162100	1.50				
1.25	PRL100125	1.25	PRL125125	1.50	PRL162125	1.75	PRL187125	1.75		
1.50	PRL100150	1.50	PRL125150	1.75	PRL162150	2.00	PRL187150	2.00	PRL200150	2.25
1.75	PRL100175	1.75	PRL125175	2.00	PRL162175	2.25	PRL187175	2.25	PRL200175	2.50
2.00	PRL100200	2.00	PRL125200	2.25	PRL162200	2.50	PRL187200	2.50	PRL200200	2.75
2.25	PRL100225	2.25	PRL125225	2.50	PRL162225	2.75	PRL187225	2.75	PRL200225	3.00
2.50	PRL100250	2.50	PRL125250	2.75	PRL162250	3.00	PRL187250	3.00	PRL200250	3.25
2.75	PRL100275	2.75	PRL125275	3.00	PRL162275	3.25	PRL187275	3.25	PRL200275	3.50
3.00	PRL100300	3.00	PRL125300	3.25	PRL162300	3.50	PRL187300	3.50	PRL200300	3.75
3.25	PRL100325	3.25	PRL125325	3.50	PRL162325	3.75	PRL187325	4.00	PRL200325	4.00
3.50	PRL100350	3.50	PRL125350	4.00	PRL162350	4.00	PRL187350	4.00	PRL200350	4.00
3.75			PRL125375	4.00	PRL162375	4.50	PRL187375	4.50	PRL200375	4.50
4.00			PRL125400	4.50	PRL162400	4.50	PRL187400	4.50	PRL200400	4.50
4.50			PRL125450	5.00	PRL162450	5.00	PRL187450	5.00	PRL200450	5.00
5.00			PRL125500	5.50	PRL162500	5.50	PRL187500	5.50	PRL200500	5.50
5.50			PRL125550	6.00	PRL162550	6.00	PRL187550	6.00	PRL200550	6.00
6.00			PRL125600	6.00	PRL162600	6.50	PRL187600	6.50	PRL200600	6.50



SPOOL TYPE PAD RETAINER-LOCKING with FLATS



BLACK OXIDE TREATMENT

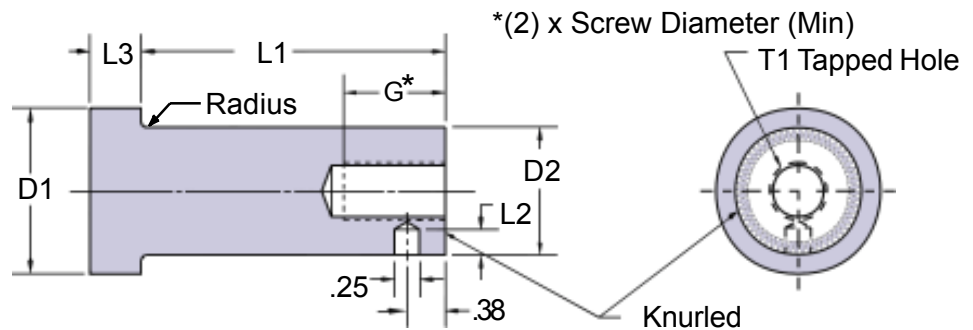
Assembly includes:
Retainer Body
Socket Head Cap Screw
Socket Set Screw

PART NUMBER	D1	D2 +.000 -.010	L2	L3	S1	S2	F	RADIUS	LOAD RATING LBS
PRLF100	1.00	.75	1.00	.38	5/8-18	5/16-18	.625	.03	1,500
PRLF125	1.25	1.00	1.12	.50	3/4-16	3/8-16	.875	.03	3,000
PRLF162	1.62	1.25	1.12	.50	7/8-14	1/2-13	1.125	.06	5,000
PRLF187	1.87	1.50	1.25	.50	1-1/8-12	5/8-11	1.250	.06	7,500
PRLF200	2.00	1.62	1.38	.50	1-1/4-12	3/4-10	1.375	.06	10,000

SPOOL TYPE PAD RETAINERS – LOCKING with FLATS										
L1 ±.005	Series PRLF 100		Series PRLF 125		Series PRLF 162		Series PRLF 187		Series PRLF 200	
	PART NUMBER	L4	PART NUMBER	L4	PART NUMBER	L4	PART NUMBER	L4	PART NUMBER	L4
1.00	PRLF100100	1.00	PRLF125100	1.25	PRLF162100	1.50				
1.25	PRLF100125	1.25	PRLF125125	1.50	PRLF162125	1.75	PRLF187125	1.75		
1.50	PRLF100150	1.50	PRLF125150	1.75	PRLF162150	2.00	PRLF187150	2.00	PRLF200150	2.25
1.75	PRLF100175	1.75	PRLF125175	2.00	PRLF162175	2.25	PRLF187175	2.25	PRLF200175	2.50
2.00	PRLF100200	2.00	PRLF125200	2.25	PRLF162200	2.50	PRLF187200	2.50	PRLF200200	2.75
2.25	PRLF100225	2.25	PRLF125225	2.50	PRLF162225	2.75	PRLF187225	2.75	PRLF200225	3.00
2.50	PRLF100250	2.50	PRLF125250	2.75	PRLF162250	3.00	PRLF187250	3.00	PRLF200250	3.25
2.75	PRLF100275	2.75	PRLF125275	3.00	PRLF162275	3.25	PRLF187275	3.25	PRLF200275	3.50
3.00	PRLF100300	3.00	PRLF125300	3.25	PRLF162300	3.50	PRLF187300	3.50	PRLF200300	3.75
3.25	PRLF100325	3.25	PRLF125325	3.50	PRLF162325	3.75	PRLF187325	4.00	PRLF200325	4.00
3.50	PRLF100350	3.50	PRLF125350	4.00	PRLF162350	4.00	PRLF187350	4.00	PRLF200350	4.00
3.75			PRLF125375	4.00	PRLF162375	4.50	PRLF187375	4.50	PRLF200375	4.50
4.00			PRLF125400	4.50	PRLF162400	4.50	PRLF187400	4.50	PRLF200400	4.50
4.50			PRLF125450	5.00	PRLF162450	5.00	PRLF187450	5.00	PRLF200450	5.00
5.00			PRLF125500	5.50	PRLF162500	5.50	PRLF187500	5.50	PRLF200500	5.50
5.50			PRLF125550	6.00	PRLF162550	6.00	PRLF187550	6.00	PRLF200550	6.00
6.00			PRLF125600	6.00	PRLF162600	6.50	PRLF187600	6.50	PRLF200600	6.50



SPOOL TYPE PAD RETAINER-REVERSED



BLACK OXIDE TREATMENT

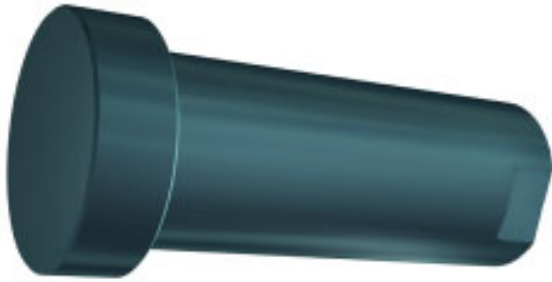
Includes:

Body Only, Customer is to supply Socket Head Screw and optional Locking Pin.

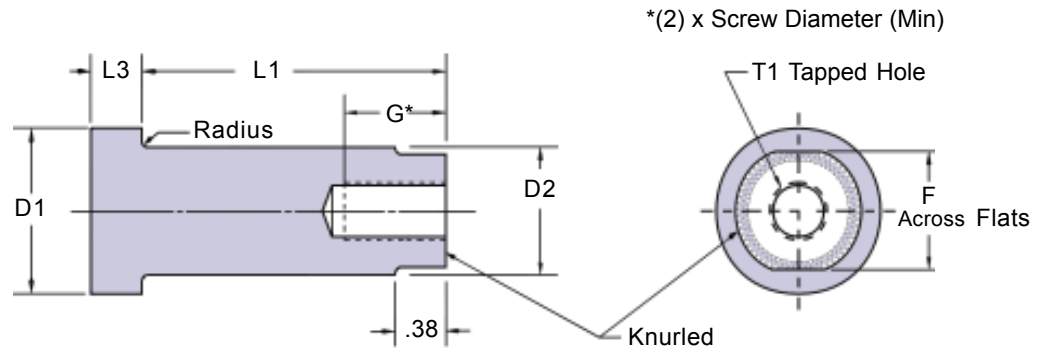
PART NUMBER	D1	D2 +.000 -.010	T1	L3	RADIUS	L2	G	LOAD RATING LBS
PRR100	1.00	.75	5/16-18	.38	.03	.18	.625	1,500
PRR125	1.25	1.00	3/8-16	.50	.03	.25	.750	3,000
PRR162	1.62	1.25	1/2-13	.50	.06	.25	1.000	5,000
PRR187	1.87	1.50	5/8-11	.50	.06	.25	1.250	7,500
PRR200	2.00	1.62	3/4-10	.50	.06	.25	1.500	10,000

SPOOL TYPE PAD RETAINERS – REVERSED STANDARD

	Series PRR 100	Series PRR 125	Series PRR 162	Series PRR 187	Series PRR 200
L1 ±.005	PART NUMBER	PART NUMBER	PART NUMBER	PART NUMBER	PART NUMBER
1.00	PRR100100	PRR125100			
1.25	PRR100125	PRR125125	PRR162125		
1.50	PRR100150	PRR125150	PRR162150	PRR187150	
1.75	PRR100175	PRR125175	PRR162175	PRR187175	PRR200175
2.00	PRR100200	PRR125200	PRR162200	PRR187200	PRR200200
2.25	PRR100225	PRR125225	PRR162225	PRR187225	PRR200225
2.50	PRR100250	PRR125250	PRR162250	PRR187250	PRR200250
2.75	PRR100275	PRR125275	PRR162275	PRR187275	PRR200275
3.00	PRR100300	PRR125300	PRR162300	PRR187300	PRR200300
3.25	PRR100325	PRR125325	PRR162325	PRR187325	PRR200325
3.50	PRR100350	PRR125350	PRR162350	PRR187350	PRR200350
3.75	PRR100375	PRR125375	PRR162375	PRR187375	PRR200375
4.00	PRR100400	PRR125400	PRR162400	PRR187400	PRR200400
4.50	PRR100450	PRR125450	PRR162450	PRR187450	PRR200450
5.00	PRR100500	PRR125500	PRR162500	PRR187500	PRR200500
5.50	PRR100550	PRR125550	PRR162550	PRR187550	PRR200550
6.00	PRR100600	PRR125600	PRR162600	PRR187600	PRR200600



SPOOL TYPE PAD RETAINER-REVERSED with FLATS



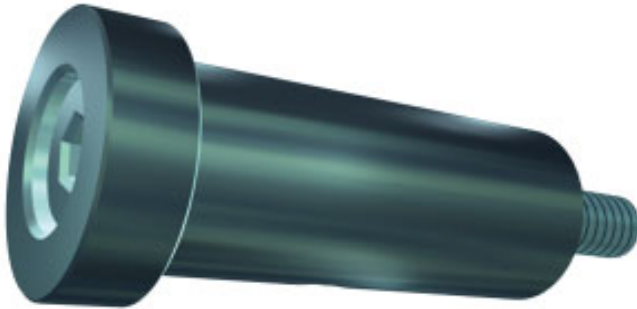
BLACK OXIDE TREATMENT

Includes:

Body Only, Customer is to supply Socket Head Screw.

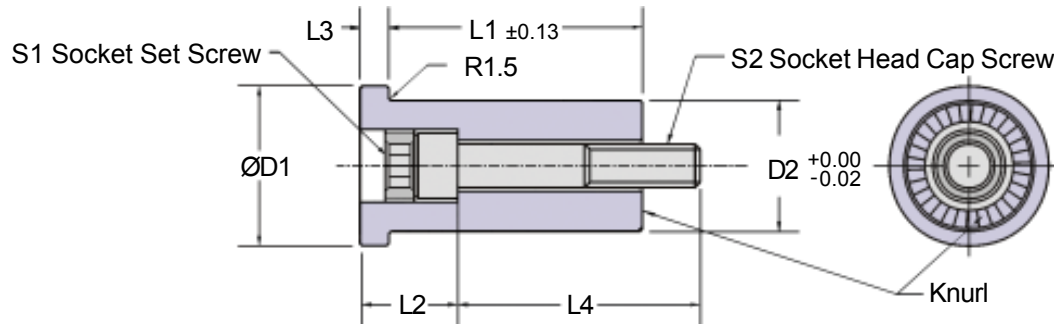
PART NUMBER	D1	D2 +.000 -.010	T1	L3	RADIUS	F	G	LOAD RATING LBS
PRRF100	1.00	.75	5/16-18	.38	.03	.625	.625	1,500
PRRF125	1.25	1.00	3/8-16	.50	.03	.875	.750	3,000
PRRF162	1.62	1.25	1/2-13	.50	.06	1.125	1.000	5,000
PRRF187	1.87	1.50	5/8-11	.50	.06	1.250	1.250	7,500
PRRF200	2.00	1.62	3/4-10	.50	.06	1.375	1.500	10,000

SPOOL TYPE PAD RETAINERS – REVERSED with FLATS					
	Series PRR 100	Series PRR 125	Series PRR 162	Series PRR 187	Series PRR 200
L1 ±.005	PART NUMBER	PART NUMBER	PART NUMBER	PART NUMBER	PART NUMBER
1.00	PRRF100100	PRRF125100			
1.25	PRRF100125	PRRF125125	PRRF162125		
1.50	PRRF100150	PRRF125150	PRRF162150	PRRF187150	
1.75	PRRF100175	PRRF125175	PRRF162175	PRRF187175	PRRF200175
2.00	PRRF100200	PRRF125200	PRRF162200	PRRF187200	PRRF200200
2.25	PRRF100225	PRRF125225	PRRF162225	PRRF187225	PRRF200225
2.50	PRRF100250	PRRF125250	PRRF162250	PRRF187250	PRRF200250
2.75	PRRF100275	PRRF125275	PRRF162275	PRRF187275	PRRF200275
3.00	PRRF100300	PRRF125300	PRRF162300	PRRF187300	PRRF200300
3.25	PRRF100325	PRRF125325	PRRF162325	PRRF187325	PRRF200325
3.50	PRRF100350	PRRF125350	PRRF162350	PRRF187350	PRRF200350
3.75	PRRF100375	PRRF125375	PRRF162375	PRRF187375	PRRF200375
4.00	PRRF100400	PRRF125400	PRRF162400	PRRF187400	PRRF200400
4.50	PRRF100450	PRRF125450	PRRF162450	PRRF187450	PRRF200450
5.00	PRRF100500	PRRF125500	PRRF162500	PRRF187500	PRRF200500
5.50	PRRF100550	PRRF125550	PRRF162550	PRRF187550	PRRF200550
6.00	PRRF100600	PRRF125600	PRRF162600	PRRF187600	PRRF200600



SPOOL TYPE PAD RETAINERS - METRIC

AUTOMOTIVE METRIC
NAAMS STANDARD



Assembly includes:
Retainer Body
Socket Head Cap Screw
Socket Set Screw

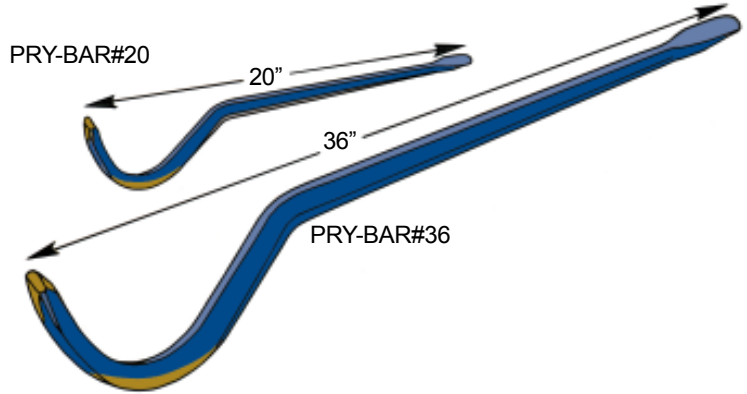
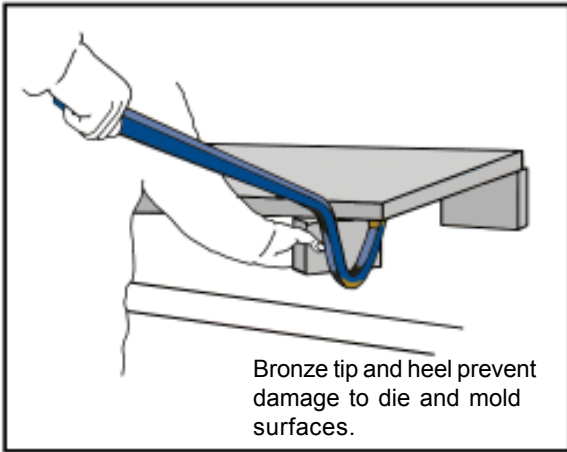
PART NUMBER	D1	D2	L2	L3	S1	S2	LOAD RATING
R3250	50	40	35	15	M27 x 2	M16 x 2.0	192 kN
R3270	70	60	40	15	M36 x 3	M20 x 2.5	299 kN

SPOOL TYPE PAD RETAINERS – LOCKING METRIC				
L1 ±0.13	Series R3250		SERIES R3270	
	PART NUMBER	L4	PART NUMBER	L4
30	R325030	45		
40	R325040	55	R327040	55
45	R325045	60	R327045	60
50	R325050	65	R327050	65
60	R325060	75	R327060	75
65	R325065	80	R327065	80
70	R325070	90	R327070	90
75	R325075	90	R327075	90
90	R325090	110	R327090	110
100	R325010	120	R327010	120
115	R325011	130	R327011	130
130	R325013	150	R327013	150
140	R325014	160	R327014	160
160	R325016	180	R327016	180

PRY BARS

HIGH CARBON FORGED STEEL TOOLS

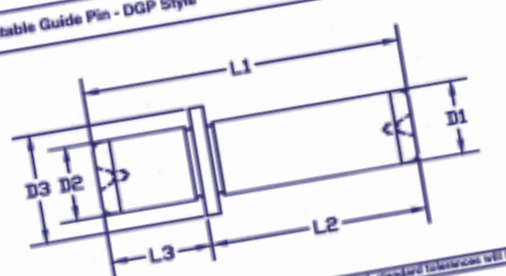
Rugged in construction and specially designed for easy handling, long life, and demanding professional use.



Lamina
Fax In Quote Form - Non Standard Products

Phone: (348) 533-8842
Fax: (348) 533-8842
Email: sales@lamina.com

Demountable Guide Pin - DGP Style



List all required dimensions/tolerances. If tolerance is not specified, standard tolerances will be used.

Required Dimension	Required Tolerance
D1	/
D2	/
D3	/
L1	/
L2	/
L3	/

Other Requirements: _____

Quantity Required: _____

Contact Information:
Name: _____
Company: _____
Phone: _____

QUOTE FORM #125-FAQ

FAX completed form for
Quoting Department
Lamina, Inc.
(348) 533-8842

Lamina
Fax In Quote Form - Non Standard Products

Phone: (348) 533-8842
Fax: (348) 533-8842
Email: sales@lamina.com

Shoulder Die Bushing - AC LAC XLAC Style



List all required dimensions/tolerances. If tolerance is not specified, standard tolerances will be used.

Required Dimension	Required Tolerance
P	/
A1	/
B	/
D	/
TH	/
L	/

Other Requirements: _____

Quantity Required: _____

Contact Information:
Name: _____
Company: _____
Phone: _____

QUOTE FORM #125-FAQ

FAX completed form for
Quoting Department
Lamina, Inc.
(348) 533-8842

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