



SUPERIOR COMPONENTS

TYPE A & TYPE D DIE SET COMPONENTS

FOR THE STAMPING INDUSTRY

2026

ABOUT WILSON TOOL INTERNATIONAL

From humble beginnings in a small manufacturing facility in St. Paul, Minnesota, Wilson Tool International has added manufacturing facilities and sales channels around the world to better serve our thousands of global customers. Throughout our expansion, our mission has never wavered — we continue to offer products and services that help you be more successful. Every product you buy, every employee with whom you communicate, and every training event you attend, are designed to help customers just like you be more successful.

At Wilson Tool, we continue to invest in your success through constant innovation. Our tooling and solutions represent decades of knowledge and experience in assisting manufacturers resolve their most challenging fabrication issues. We understand that no two jobs are the same. Change is the only constant in manufacturing. So, working with a tooling supplier who's flexible, nimble, and knowledgeable is important.

Our goal is to deliver exceptional
customer service
along with the most reliable and
innovative products and solutions
so that our **customers**
can be more successful.

When you have a challenge, reach out to us. At Wilson Tool we are more than tools... we are solutions. Your local Sales Engineer is available in person, by phone and through e-mail. Let us put our many decades of expertise to the test. We will work with you to find the best possible solution to whatever challenge you may be facing. And every order comes with our guarantee to outperform your current tooling.

From all of us at Wilson Tool, thank you for the trust you have placed in us to provide products and services that are critical to your business. We look forward to your continued success as we head into the future.



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CUSTOM COMPONENTS

In this catalog you will find thousands of industry standard components, manufactured and inventoried to the specifications found in these pages. However, the demands of the tool and die industry and manufacturing are as diverse as they are challenging.

What happens when your challenges demand custom solutions?

Superior Components is ready to help you with custom made components. Components with modifications like extra running clearance, heavier press fit, and other changes, can be quickly produced to work with industry standard components. Entire guiding and locating systems can also be tailored for your unique application.

Custom pins, bushings, tie rods, locators and other components can be sourced through Superior Components from one piece to production quantities. Our team is ready to use our decades of experience to assist you with your new build and repair jobs today.



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TYPE A COMPONENTS

As the exclusive distributor of Superior Components, Impax Tooling Solutions® offers the unparalleled quality and precision that Superior is renowned for. With thousands of components in-stock and ready for immediate delivery, we provide the extensive inventory you need to meet your urgent tooling needs.

Type A Components

As an original OEM manufacturer of Type A style components, Superior has a complete inventory on-site in their Oak Creek, WI warehouse, including:

- Friction Components
 - Demountable, press fit and shoulder pins
 - Press fit shoulder and sleeve bushings in steel and bronze
 - Demountable bushings in steel, bronze and Bronze-Rite®
- Type "L" Industry Compatible Components
 - Demountable bushings in Bronze-Rite®
- Ball Bearing Components
 - Demountable and press fit pins in Type A and Maxicage™
 - Demountable and press fit sleeve bushings
 - Cages in Type A and Maxicage™
- Hardware
 - Accessories for ball cages, demountable pins and bushings

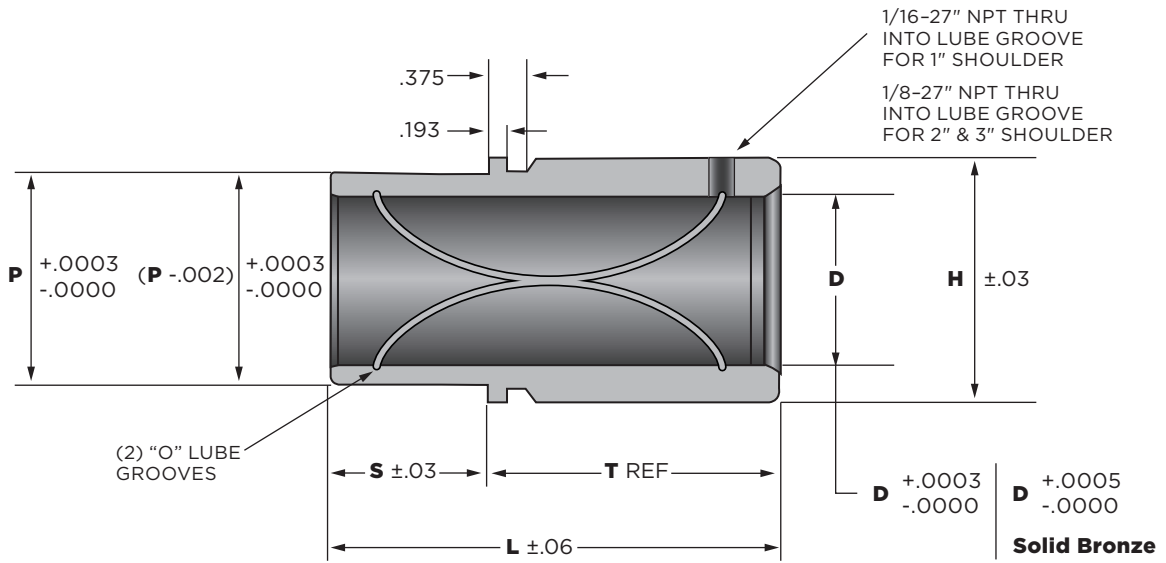
Innovative Features

- Maxicage™ System The simplest and most effective ball cage system on the market, providing maximum engagement with minimum deflection. All ball bearing pins now Maxicage ready.
- Bronze-Rite® Bushings Our proprietary process adds between .015" to .020" of bronze to the ID of the bushing, offering the benefits of bronze with the durability of steel. Unlike bronze plated bushings, Bronze-Rite® will not peel, flake or chip.



TYPE A COMPONENTS

DEMOUNTABLE SHOULDER BUSHINGS



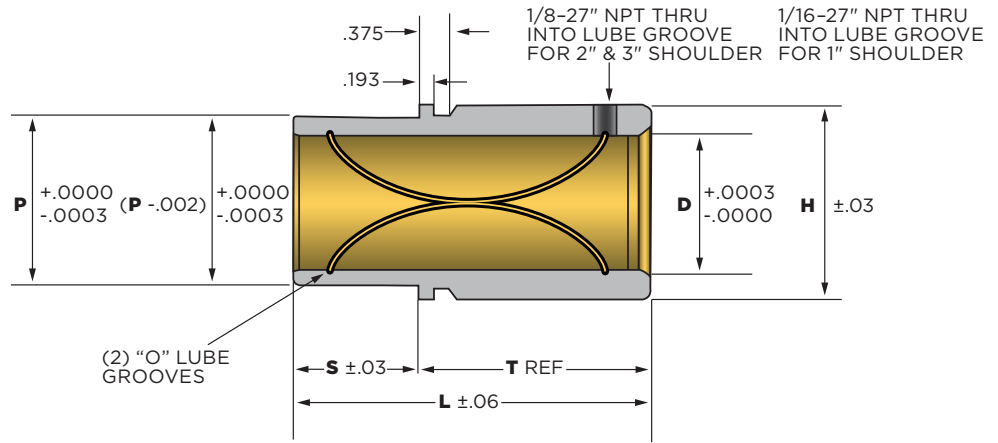
TYPE A – FRICTION

Dia.	D	P	H
3/4"	.7503	1.1253	1.38
1"	1.0003	1.5003	1.75
1-1/4"	1.2504	1.7503	2.00
1-1/2"	1.5005	2.0003	2.25
1-3/4"	1.7506	2.2503	2.50
2"	2.0007	2.5003	2.75
2-1/2"	2.5008	3.1253	3.38
3"	3.0010	3.6253	3.88

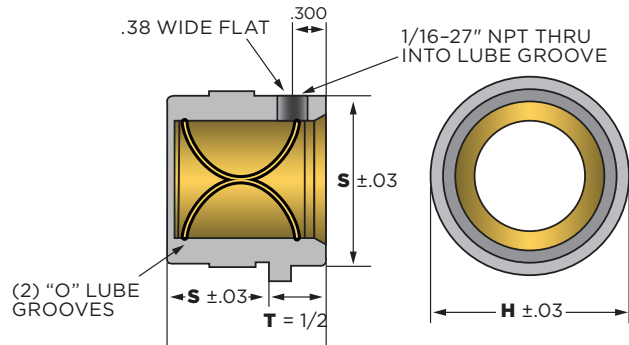
Steel bushings hardened to 60 RC ± 2 on functional areas.

STEEL & BRONZE												
Dia.	T = 1"				T = 2"				T = 3"			
	S	L	Steel Part No.	Bronze Part No.	S	L	Steel Part No.	Bronze Part No.	S	L	Steel Part No.	Bronze Part No.
3/4"	.88	1.88	311-0610	312-0610	.88	2.88	311-0620	312-0620	1.13	4.12	311-0630	312-0630
1"			311-0810	312-0810			311-0820	312-0820			311-0830	312-0830
1-1/4"	1.13	2.12	311-1010	312-1010	1.13	3.12	311-1020	312-1020			311-1030	312-1030
1-1/2"			311-1210	312-1210			311-1220	312-1220	1.38	4.38	311-1230	312-1230
1-3/4"	1.38	2.38	311-1410	312-1410	1.38	3.38	311-1420	312-1420	1.63	4.62	311-1430	312-1430
2"	1.63	2.62	311-1610	312-1610	1.63	3.62	311-1620	312-1620	1.88	4.88	311-1630	312-1630
2-1/2"	1.88	2.88	311-2010	312-2010	1.88	3.88	311-2020	312-2020			311-2030	312-2030
3"	2.63	3.62	311-2410	312-2410	2.63	4.62	311-2420	312-2420	2.63	5.62	311-2430	312-2430

DEMOUNTABLE SHOULDER BUSHINGS



1/2" SHOULDER CONFIGURATION



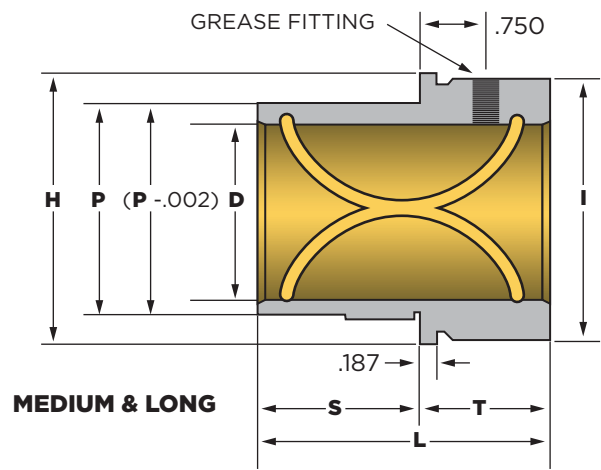
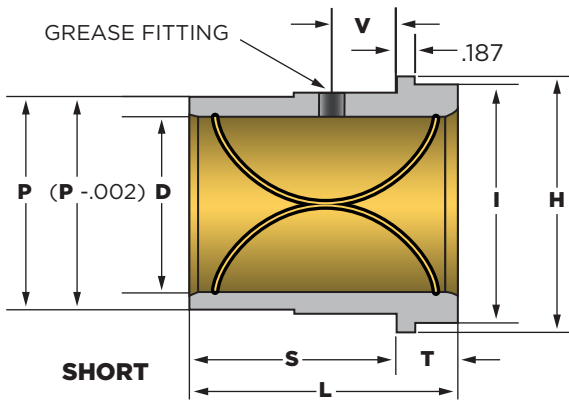
Dia.	D	P	H
1"	1.0003	1.5003	1.75
1-1/4"	1.2504	1.7503	2.00
1-1/2"	1.5005	2.0003	2.25
1-3/4"	1.7506	2.2503	2.50
2"	2.0007	2.5003	2.75
2-1/2"	2.5008	3.1253	3.38
3"	3.0010	3.6253	3.88

Hardened to 60 RC ± 2 with Bronze-Rite® ID

BRONZE-RITE®												
Dia.	T = 1/2"			T = 1"			T = 2"			T = 3"		
	S	L	Part No.	S	L	Part No.	S	L	Part No.	S	L	Part No.
1"	.88	1.38	313P0805	.88	1.88	313P0810	.88	2.88	313P0820	1.13	4.12	313P0830
1-1/4"	1.13	1.62	313P1005	1.13	2.12	313P0110	1.13	3.12	313P1020			313P1030
		1.88	2.38	313P1005L	—	—	—	—	—	—	—	—
1-1/2"	1.13	1.62	313P1205	1.13	2.12	313P1210	1.13	3.12	313P1220	1.38	4.38	313P1230
	1.88	2.38	313P1205L	—	—	—	—	—	—	—	—	—
1-3/4"	1.38	1.88	313P1405	1.38	2.38	313P1410	1.38	3.38	313P1420	1.63	4.62	313P1430
2"	1.63	2.12	313P1605	1.63	2.62	313P1610	1.63	3.62	313P1620	1.88	4.88	313P1630
2-1/2"	1.88	2.38	313P205	1.88	2.88	313P2010	1.88	3.88	313P2020			313P2030
		3.62	4.12	313P205L	—	—	—	—	—	—	—	—
3"	2.63	3.12	313P2405	2.63	3.62	313P2410	2.63	4.62	313P2420	2.63	5.62	313P2340
	4.62	5.12	313P2405L	—	—	—	—	—	—	—	—	—

TYPE A – FRICTION

DEMOUNTABLE SHOULDER BUSHINGS



Hardened to 60 RC ± 2 with Bronze-Rite® ID

TYPE "L" (BRONZE-RITE®)

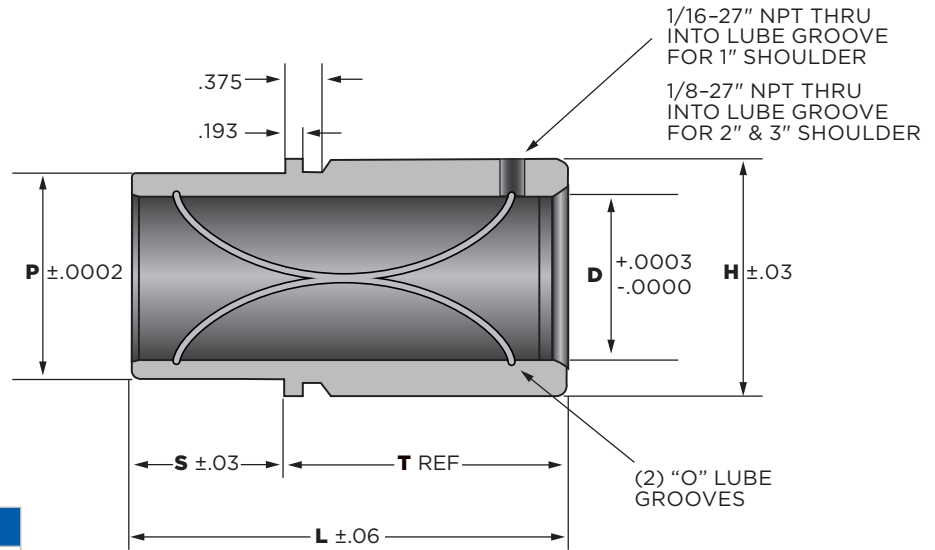
Dia.	T = SHORT SHOULDER							V	Part No.
	D	P	H	I	S	T	L		
1"	1.0003	1.5003	1.75	1.56	1.38	.50	1.88	0.75	313-0810
1-1/4"	1.2504	1.7503	2.12	1.94	1.88	.50	2.38		313-1010
1-1/2"	1.5005	2.0003	2.38	2.19					313-1210
1-3/4"	1.7506	2.2503	2.62	2.44	313-1410				
2"	2.0007	2.5003	2.94	2.75	2.38	.50	2.88	1.25	313-1610
2-1/2"	2.5008	3.0003	3.38	3.19					3.00
3"	3.0010	3.5003	3.88	3.68	2.62	.38	4.00	1.25	313-2410

Dia.	T = MEDIUM SHOULDER							V	Part No.
	D	P	H	I	S	T	L		
1"	1.0003	1.5003	1.75	1.66	0.88	1.25	2.12	0.75	313-0820
1-1/4"	1.2504	1.7503	2.12	2.03	1.12	1.50	2.62		313-1020
1-1/2"	1.5005	2.0003	2.38	2.28	1.38		2.88		313-1220
1-3/4"	1.7506	2.2503	2.62	2.53	1.62	3.12	313-1420		
2"	2.0007	2.5003	2.94	3.03	1.50	1.88	3.38	1.25	313-1620
2-1/2"	2.5008	3.0003	3.38	3.53	2.00		3.88		313-2020
3"	3.0010	3.6253	3.88	4.28	1.88	2.00	3.88	1.25	313-2420

Dia.	T = LONG SHOULDER							V	Part No.
	D	P	H	I	S	T	L		
1"	1.0003	1.5003	1.75	1.66	0.88	2.25	3.12	0.75	313-0830
1-1/4"	1.2504	1.7503	2.12	2.03	1.12	2.38	3.50		313-1030
1-1/2"	1.5005	2.0003	2.38	2.28	1.38	2.75	4.12		313-1230
1-3/4"	1.7506	2.2503	2.62	2.53	1.62	3.00	4.62		313-1430
2"	2.0007	2.5003	2.94	3.03				3.50	5.38
2-1/2"	2.5008	3.0003	3.62	3.53	1.88	4.00	5.88	0.75	313-2030
3"	3.0010	3.6253	3.88	4.28					313-2430

TYPE A – FRICTION

PRESS FIT SHOULDER BUSHINGS



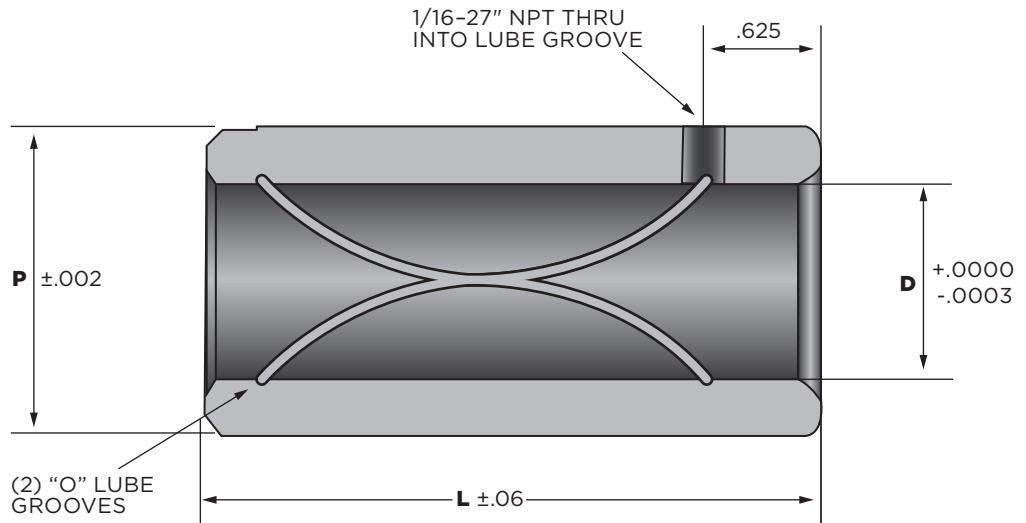
Dia.	D	P	H
3/4"	.7507	1.1265	1.38
1"	1.0003	1.5023	1.75
1-1/4"	1.2504	1.7523	2.00
1-1/2"	1.5005	2.0024	2.25
1-3/4"	1.7506	2.2528	2.50
2"	2.0007	2.5028	2.75
2-1/2"	2.5008	3.1278	3.38
3"	3.0010	3.6280	3.88

Hardened to 60 RC ± 2

STEEL & BRONZE												
Dia.	T = 1"				T = 2"				T = 3"			
	S	L	Steel Part No.	Bronze Part No.	S	L	Steel Part No.	Bronze Part No.	S	L	Steel Part No.	Bronze Part No.
3/4"	.88	1.88	314-0610	316-0610	.88	2.88	314-0620	316-0620	1.13	4.12	314-0630	316-0630
1"			314-0810	316-0810			314-0820	316-0820			314-0830	316-0830
1-1/4"	1.13	2.12	314-1010	316-1010	1.13	3.12	314-1020	316-1020	1.38	4.38	314-1030	316-1030
1-1/2"			314-1210	316-1210			314-1220	316-1220			314-1230	316-1230
1-3/4"	1.38	2.38	314-1410	316-1410	1.38	3.38	314-1420	316-1420	1.63	4.62	314-1430	316-1430
2"	1.63	2.62	314-1610	316-1610	1.63	3.62	314-1620	316-1620	1.88	4.88	314-1630	316-1630
2-1/2"	1.88	2.88	314-2010	316-2010	1.88	3.88	314-2020	316-2020			314-2030	316-2030
3"	2.63	3.62	314-2410	316-2410	2.63	4.62	314-2420	316-2420	2.63	5.62	314-2430	316-2430

TYPE A – FRICTION

PRESS FIT STRAIGHT SLEEVE BUSHINGS



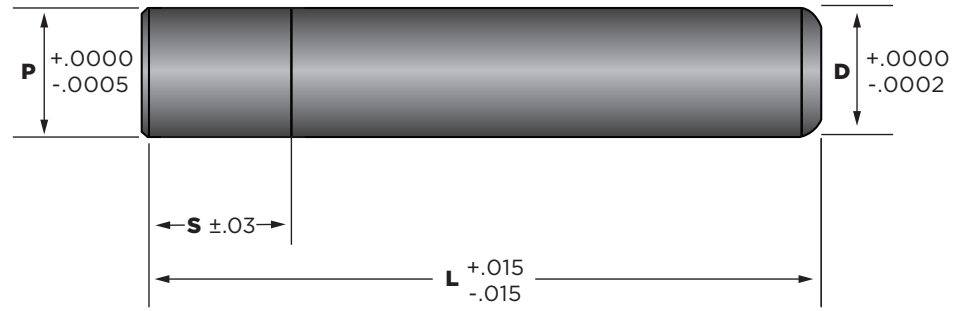
Steel bushings hardened to
60 RC ± 2 on functional areas.

STEEL & BRONZE

Dia.	D	P	L = 2"		L = 2-1/2"		L = 3"	
			Steel Part No.	Bronze Part No.	Steel Part No.	Bronze Part No.	Steel Part No.	Bronze Part No.
3/4"	.7507	1.1265	315-0604	317-0604	315-0605	317-0605	315-0606	317-0606
1"	1.0003	1.5023	315-0804	317-0804	315-0805	317-0805	315-0806	317-0806
1-1/4"	1.2504	1.7523	315-1004	317-1004	315-1005	317-1005	315-1006	317-1006
1-1/2"	1.5005	2.0024	315-1204	317-1204	315-1205	317-1205	315-1206	317-1206
1-3/4"	1.7506	2.2528	315-1404	317-1404	315-1405	317-1405	315-1406	317-1406
2"	2.0007	2.5028	315-1604	317-1604	315-1605	317-1605	315-1606	317-1606
2-1/2"	2.5008	3.1278	315-2004	317-2004	315-2005	317-2005	315-2006	317-2006
3"	3.0010	3.6280	315-2404	317-2404	315-2405	317-2405	315-2406	317-2406

PRESS FIT STRAIGHT GUIDE PINS

Dia.	D	P	S
3/4"	.7502	.7502	1.12
1"	1.0002	1.0022	1.50
1-1/4"	1.2502	1.2500	1.75
1-1/2"	1.5002	1.5025	1.75
1-3/4"	1.7502	1.7530	2.25
2"	2.0002	2.0030	2.50
2-1/2"	2.5002	2.5030	3.00
3"	3.0002	3.0030	3.50

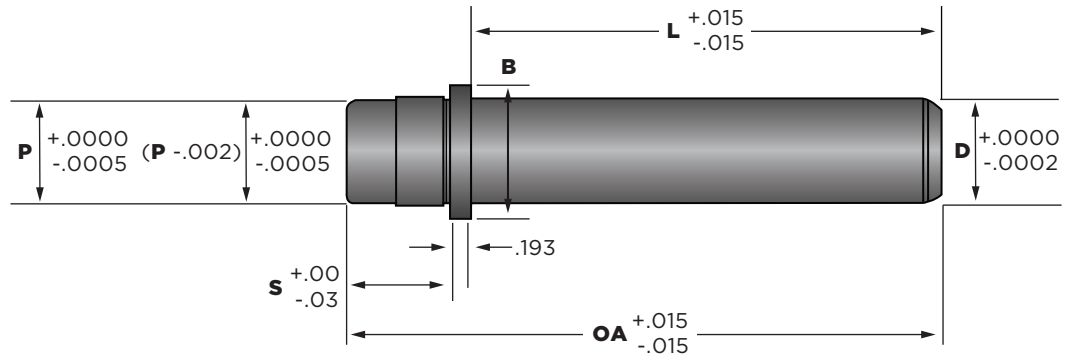


Hardened to 60 RC ± 2

L	Dia. = 3/4"	Dia. = 1"	Dia. = 1-1/4"	Dia. = 1-1/2"	Dia. = 1-3/4"	Dia. = 2"	Dia. = 2-1/2"	Dia. = 2-3/4"
	Steel Part No.	Bronze Part No.	Steel Part No.	Bronze Part No.	Steel Part No.	Bronze Part No.	Steel Part No.	Bronze Part No.
3.250	321-0613	321-0813	—	—	—	—	—	—
3.500	321-0614	321-0814	—	—	—	—	—	—
4.000	321-0616	321-0816	321-1016	321-1216	—	—	—	—
4.250	321-0617	321-0817	321-1017	321-1217	—	—	—	—
4.500	321-0618	321-0818	321-1018	321-1218	321-1418	321-1618	—	—
4.750	321-0619	321-0819	321-1019	321-1219	321-1419	321-1619	—	—
5.000	321-0620	321-0820	321-1020	321-1220	321-1420	321-1620	—	—
5.250	321-0621	321-0821	321-1021	321-1221	321-1421	321-1621	—	—
5.500	321-0622	321-0822	321-1022	321-1222	321-1422	321-1622	—	—
5.750	321-0623	321-0823	321-1023	321-1223	321-1423	321-1623	—	—
6.000	321-0624	321-0824	321-1024	321-1224	321-1424	321-1624	321-2024	321-2424
6.250	321-0625	321-0825	321-1025	321-1225	321-1425	321-1625	321-2025	321-2425
6.500	321-0626	321-0826	321-1026	321-1226	321-1426	321-1626	321-2026	321-2426
6.750	321-0627	321-0827	321-1027	321-1227	321-1427	321-1627	321-2027	321-2427
7.000	321-0628	321-0828	321-1028	321-1228	321-1428	321-1628	321-2028	321-2428
7.250	321-0629	321-0829	321-1029	321-1229	321-1429	321-1629	321-2029	321-2429
7.500	321-0630	321-0830	321-1030	321-1230	321-1430	321-1630	321-2030	321-2430
7.750	321-0631	321-0831	321-1031	321-1231	321-1431	321-1631	321-2031	321-2431
8.000	321-0632	321-0832	321-1032	321-1232	321-1432	321-1632	321-2032	321-2432
8.500	321-0634	321-0834	321-1034	321-1234	321-1434	321-1634	321-2034	321-2434
9.000	321-0636	321-0836	321-1036	321-1236	321-1436	321-1636	321-2036	321-2436
9.500	321-0638	321-0838	321-1038	321-1238	321-1438	321-1638	321-2038	321-2438
10.000	321-0640	321-0840	321-1040	321-1240	321-1440	321-1640	321-2040	321-2440
10.500	—	321-0842	321-1042	321-1242	321-1442	321-1642	321-2042	321-2442
11.000	—	321-0844	321-1044	321-1244	321-1444	321-1644	321-2044	321-2444
11.500	—	321-0846	321-1046	321-1246	321-1446	321-1646	321-2046	321-2446
12.000	—	321-0848	321-1048	321-1248	321-1448	321-1648	321-2048	321-2448
13.000	—	321-0852	321-1052	321-1252	321-1452	321-1652	321-2052	321-2452
14.000	—	321-0856	321-1056	321-1256	321-1456	321-1656	321-2056	321-2456
15.000	—	—	321-1060	321-1260	321-1460	321-1660	321-2060	321-2460
16.000	—	—	—	321-1264	321-1464	321-1664	321-2064	321-2464
17.000	—	—	—	—	321-1468	321-1668	321-2068	321-2468
18.000	—	—	—	—	321-1472	321-1672	321-2072	321-2472
20.000	—	—	—	—	321-1480	321-1680	321-2080	321-2480

TYPE A – FRICTION

DEMOUNTABLE GUIDE PINS



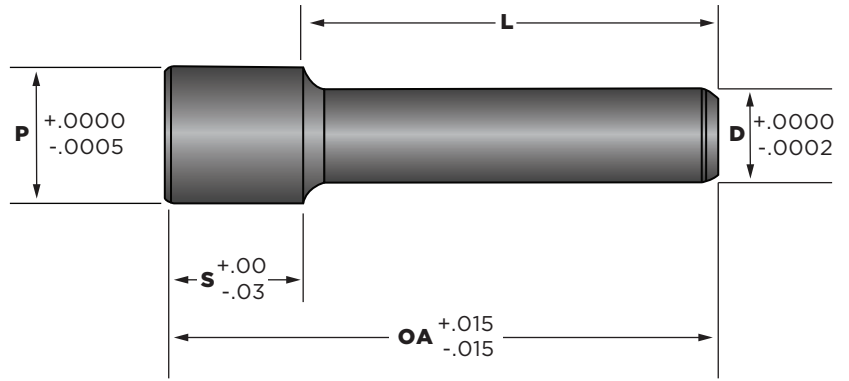
Dia.	D	P	B	S
1"	1.0002	1.0000	1.2500	1.19
1-1/4"	1.2502	1.2500	1.5000	
1-1/2"	1.5002	1.5000	1.7500	1.44
1-3/4"	1.7502	1.7500	2.0000	1.69
2"	2.0002	2.0000	2.5000	1.94
2-1/2"	2.5002	2.5000	3.0000	
3"	3.0002	3.0000	3.5000	

Hardened to 60 RC ± 2

L	Dia. = 1"		Dia. = 1-1/4"		Dia. = 1-1/2"		Dia. = 1-3/4"		Dia. = 2"		Dia. = 2-1/2"		Dia. = 3"	
	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.
3.000	4.188	322-0812	4.188	322-1012	—	—	—	—	—	—	—	—	—	—
3.250	4.438	322-0813	4.438	322-1013	—	—	—	—	—	—	—	—	—	—
3.500	4.688	322-0814	4.688	322-1014	4.938	322-1214	—	—	—	—	—	—	—	—
3.750	4.938	322-0815	4.938	322-1015	5.188	322-1215	—	—	—	—	—	—	—	—
4.000	5.188	322-0816	5.188	322-1016	5.438	322-1216	5.688	322-1416	5.938	322-1616	—	—	—	—
4.250	5.438	322-0817	5.438	322-1017	5.688	322-1217	5.938	322-1417	6.188	322-1617	—	—	—	—
4.500	5.688	322-0818	5.688	322-1018	5.938	322-1218	6.188	322-1418	6.438	322-1618	—	—	—	—
4.750	5.938	322-0819	5.938	322-1019	5.988	322-1219	6.438	322-1419	6.688	322-1619	—	—	—	—
5.000	6.188	322-0820	6.188	322-1020	6.438	322-1220	6.688	322-1420	6.938	322-1620	—	—	—	—
5.500	6.688	322-0822	6.688	322-1022	6.938	322-1222	7.188	322-1422	7.438	322-1622	—	—	—	—
6.000	7.188	322-0824	7.188	322-1024	7.438	322-1224	7.688	322-1424	7.938	322-1624	7.938	322-2024	7.938	322-2424
6.500	7.688	322-0826	7.688	322-1026	7.938	322-1226	8.188	322-1426	8.438	322-1626	8.438	322-2026	8.438	322-2426
7.000	8.188	322-0828	8.188	322-1028	8.438	322-1228	8.688	322-1428	8.938	322-1628	8.938	322-2028	8.938	322-2428
7.500	8.688	322-0830	8.688	322-1030	8.938	322-1230	9.188	322-1430	9.438	322-1630	9.438	322-2030	9.438	322-2430
8.000	9.188	322-0832	9.188	322-1032	9.438	322-1232	9.688	322-1432	9.938	322-1632	9.938	322-2032	9.938	322-2432
8.500	—	—	9.688	322-1034	9.938	322-1234	10.188	322-1434	10.438	322-1634	10.438	322-2034	10.438	322-2434
9.000	—	—	10.188	322-1036	10.438	322-1236	10.688	322-1436	10.938	322-1636	10.938	322-2036	10.938	322-2436
9.500	—	—	10.688	322-1038	10.938	322-1238	11.188	322-1438	11.438	322-1638	11.438	322-2038	11.438	322-2438
10.000	—	—	11.188	322-1040	11.438	322-1240	11.688	322-1440	11.938	322-1640	11.938	322-2040	11.938	322-2440
11.000	—	—	—	—	—	—	12.688	322-1444	12.938	322-1644	12.938	322-2044	12.938	322-2444
12.000	—	—	—	—	—	—	13.688	322-1448	13.938	322-1648	13.938	322-2048	13.938	322-2448
13.000	—	—	—	—	—	—	—	—	14.938	322-1652	14.938	322-2052	14.938	322-2452
14.000	—	—	—	—	—	—	—	—	15.938	322-1656	15.938	322-2056	15.938	322-2456
15.000	—	—	—	—	—	—	—	—	—	—	16.938	322-2060	16.938	322-2460
16.000	—	—	—	—	—	—	—	—	—	—	17.938	322-2064	17.938	322-2464

TYPE A — FRICTION

SHOULDER GUIDE PINS



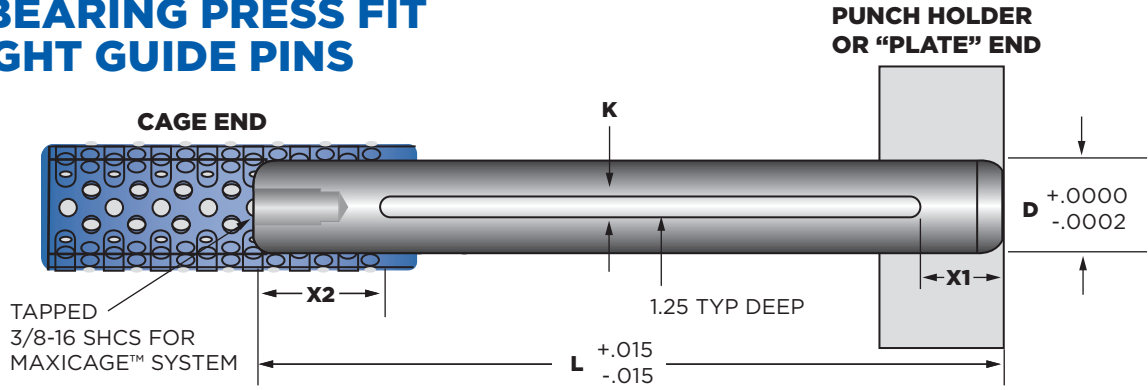
Dia.	D	P	S
1"	1.0002	1.5120	1.50
1-1/4"	1.2502	1.7620	1.75
1-1/2"	1.5002	2.0120	2.00
1-3/4"	1.7502	2.2620	2.25
2"	2.0002	2.5120	3.50
2-1/2"	2.5002	3.0120	4.00
3"	3.0002	3.6370	

Hardened to 60 RC ± 2

OA	Dia. = 1"		Dia. = 1-1/4"		Dia. = 1-1/2"		Dia. = 1-3/4"		Dia. = 2"		Dia. = 2-1/2"		Dia. = 3"	
	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.
5.500	4.000	323-0822	-	-	-	-	-	-	-	-	-	-	-	-
6.000	4.500	323-0824	4.250	323-1024	4.000	323-1224	-	-	-	-	-	-	-	-
6.500	5.000	323-0826	4.750	323-1026	4.500	323-1226	-	-	-	-	-	-	-	-
7.000	5.500	323-0828	5.250	323-1028	5.000	323-1228	-	-	-	-	-	-	-	-
7.500	6.000	323-0830	5.750	323-1030	5.500	323-1230	-	-	-	-	-	-	-	-
8.000	6.500	323-0832	6.250	323-1032	6.000	323-1232	5.250	323-1430	4.500	323-1632	-	-	-	-
8.500	7.000	323-0834	6.750	323-1034	6.500	323-1234	5.750	323-1432	5.000	323-1634	-	-	-	-
9.000	7.500	323-0836	7.250	323-1036	7.000	323-1236	6.250	323-1434	5.500	323-1636	5.000	323-2036	-	-
10.000	-	-	8.250	323-1040	8.000	323-1240	6.750	323-1436	6.500	323-1640	6.000	323-2040	-	-
11.000	-	-	9.250	323-1044	9.000	323-1244	7.750	323-1440	7.500	323-1644	7.000	323-2044	7.000	323-2444
12.000	-	-	10.250	323-1048	10.000	323-1248	8.750	323-1444	8.500	323-1648	8.000	323-2048	8.000	323-2448
13.000	-	-	11.250	323-1052	11.000	323-1252	9.750	323-1448	9.500	323-1652	9.000	323-2052	9.000	323-2452
14.000	-	-	12.250	323-1056	12.000	323-1256	10.750	323-1452	10.500	323-1656	10.000	323-2056	10.000	323-2456
15.000	-	-	-	-	-	-	-	-	11.500	323-1660	11.000	323-2060	11.000	323-2460
17.000	-	-	-	-	-	-	-	-	13.500	323-1668	13.000	323-2068	13.000	323-2468

TYPE A – FRICTION

BALL BEARING PRESS FIT STRAIGHT GUIDE PINS



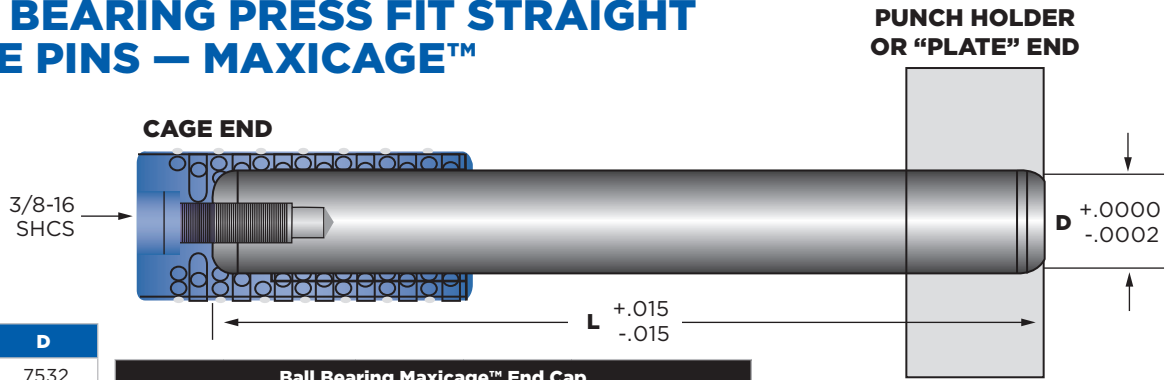
Dia.	D	X1	X2	K
3/4"	.7532	.700	1.000	.219
1"	1.0032	.875	1.375	
1-1/4"	1.2532			
1-1/2"	1.5032	1.125	1.625	
1-3/4"	1.7532	1.375	1.875	
2"	2.0033	1.625	2.000	
2-1/2"	2.5033	2.500	3.375	
3"	3.0033			

Hardened to 60 RC ± 2

L	D = 3/4"	D = 1"	D = 1-1/4"	D = 1-1/2"	D = 1-3/4"	D = 2"	D = 2-1/2"	D = 2-3/4"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
4.000	331-0616	331-0816	331-1016	—	—	—	—	—
4.250	331-0617	331-0817	331-1017	331-1217	—	—	—	—
4.500	331-0618	331-0818	331-1018	331-1218	—	—	—	—
4.750	331-0619	331-0819	331-1019	331-1219	—	—	—	—
5.000	331-0620	331-0820	331-1020	331-1220	331-1420	331-1620	—	—
5.250	331-0621	331-0821	331-1021	331-1221	331-1421	331-1621	—	—
5.500	331-0622	331-0822	331-1022	331-1222	331-1422	331-1622	—	—
5.750	331-0623	331-0823	331-1023	331-1223	331-1423	331-1623	—	—
6.000	331-0624	331-0824	331-1024	331-1224	331-1424	331-1624	—	—
6.250	331-0625	331-0825	331-1025	331-1225	331-1425	331-1625	—	—
6.500	331-0626	331-0826	331-1026	331-1226	331-1426	331-1626	—	—
6.750	331-0627	331-0827	331-1027	331-1227	331-1427	331-1627	—	—
7.000	331-0628	331-0828	331-1028	331-1228	331-1428	331-1628	—	—
7.250	331-0629	331-0829	331-1029	331-1229	331-1429	331-1629	—	—
7.500	331-0630	331-0830	331-1030	331-1230	331-1430	331-1630	—	—
7.750	331-0631	331-0831	331-1031	331-1231	331-1431	331-1631	—	—
8.000	331-0632	331-0832	331-1032	331-1232	331-1432	331-1632	331-2032	331-2432
8.500	331-0634	331-0834	331-1034	331-1234	331-1434	331-1634	331-2034	331-2434
9.000	331-0636	331-0836	331-1036	331-1236	331-1436	331-1636	331-2036	331-2436
9.500	331-0638	331-0838	331-1038	331-1238	331-1438	331-1638	331-2038	331-2438
10.000	331-0640	331-0840	331-1040	331-1240	331-1440	331-1640	331-2040	331-2440
10.500	331-0642	331-0842	331-1042	331-1242	331-1442	331-1642	331-2042	331-2442
11.000	331-0644	331-0844	331-1044	331-1244	331-1444	331-1644	331-2044	331-2444
11.500	331-0646	331-0846	331-1046	331-1246	331-1446	331-1646	331-2046	331-2446
12.000	331-0648	331-0848	331-1048	331-1248	331-1448	331-1648	331-2048	331-2448
13.000	—	—	—	—	—	331-1652	331-2052	331-2452
14.000	—	—	—	—	—	331-1656	331-2056	331-2456
15.000	—	—	—	—	—	—	—	331-2460
16.000	—	—	—	—	—	—	—	331-2464
17.000	—	—	—	—	—	—	—	331-2468
18.000	—	—	—	—	—	—	—	331-2472
20.000	—	—	—	—	—	—	—	331-2480

TYPE A — BALL BEARING

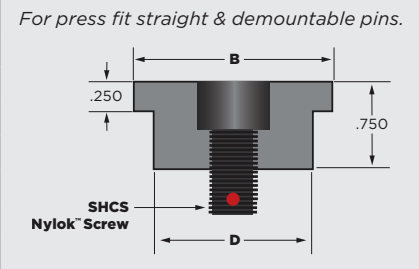
BALL BEARING PRESS FIT STRAIGHT GUIDE PINS – MAXICAGE™



Dia.	D
3/4"	.7532
1"	1.0032
1-1/4"	1.2532
1-1/2"	1.5032
1-3/4"	1.7532
2"	2.0033
2-1/2"	2.5033
3"	3.0033

Hardened to 60 RC ± 2

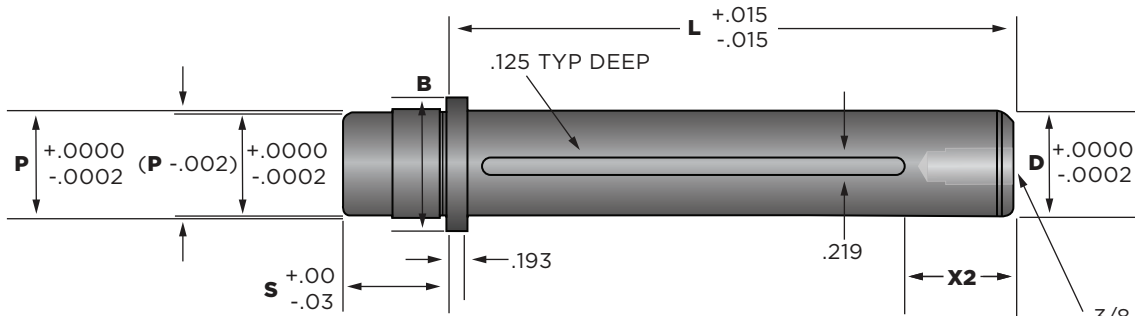
Ball Bearing Maxicage™ End Cap				
Pin Dia.	Part No.	D	B	SHCS
3/4"	334-0604	5/8	1	5/16"-18 SHCS 1" LONG
1"	334-0804	7/8	1-1/4	
1-1/4"	334-1004	1-1/8	1-1/2	3/8"-16 SHCS 1" LONG
1-1/2"	334-1204	1-3/8	1-3/4	
1-3/4"	334-1404	1-5/8	2	
2"	334-1604	1-7/8	2-3/8	
2-1/2"	334-2004	2-3/8	2-7/8	
3"	334-2404	2-7/8	3-3/8	



L	D = 3/4"	D = 1"	D = 1-1/4"	D = 1-1/2"	D = 1-3/4"	D = 2"	D = 2-1/2"	D = 2-3/4"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
4.000	331M0616	331M0816	331M1016	—	—	—	—	—
4.250	331M0617	331M0817	331M1017	331M1217	—	—	—	—
4.500	331M0618	331M0818	331M1018	331M1218	—	—	—	—
4.750	331M0619	331M0819	331M1019	331M1219	—	—	—	—
5.000	331M0620	331M0820	331M1020	331M1220	331M1420	331M1620	—	—
5.250	331M0621	331M0821	331M1021	331M1221	331M1421	331M1621	—	—
5.500	331M0622	331M0822	331M1022	331M1222	331M1422	331M1622	—	—
5.750	331M0623	331M0823	331M1023	331M1223	331M1423	331M1623	—	—
6.000	331M0624	331M0824	331M1024	331M1224	331M1424	331M1624	—	—
6.250	331M0625	331M0825	331M1025	331M1225	331M1425	331M1625	—	—
6.500	331M0626	331M0826	331M1026	331M1226	331M1426	331M1626	—	—
6.750	331M0627	331M0827	331M1027	331M1227	331M1427	331M1627	—	—
7.000	331M0628	331M0828	331M1028	331M1228	331M1428	331M1628	—	—
7.250	331M0629	331M0829	331M1029	331M1229	331M1429	331M1629	—	—
7.500	331M0630	331M0830	331M1030	331M1230	331M1430	331M1630	—	—
7.750	331M0631	331M0831	331M1031	331M1231	331M1431	331M1631	—	—
8.000	331M0632	331M0832	331M1032	331M1232	331M1432	331M1632	331M2032	331M2432
8.500	331M0634	331M0834	331M1034	331M1234	331M1434	331M1634	331M2034	331M2434
9.000	331M0636	331M0836	331M1036	331M1236	331M1436	331M1636	331M2036	331M2436
9.500	331M0638	331M0838	331M1038	331M1238	331M1438	331M1638	331M2038	331M2438
10.000	331M0640	331M0840	331M1040	331M1240	331M1440	331M1640	331M2040	331M2440
10.500	331M0642	331M0842	331M1042	331M1242	331M1442	331M1642	331M2042	331M2442
11.000	331M0644	331M0844	331M1044	331M1244	331M1444	331M1644	331M2044	331M2444
11.500	331M0646	331M0846	331M1046	331M1246	331M1446	331M1646	331M2046	331M2446
12.000	331M0648	331M0848	331M1048	331M1248	331M1448	331M1648	331M2048	331M2448
13.000	—	—	—	—	—	331M1652	331M2052	331M2452
14.000	—	—	—	—	—	331M1656	331M2056	331M2456
15.000	—	—	—	—	—	—	—	331M2460
16.000	—	—	—	—	—	—	—	331M2464
17.000	—	—	—	—	—	—	—	331M2468
18.000	—	—	—	—	—	—	—	331M2472
20.000	—	—	—	—	—	—	—	331M2480

TYPE A – BALL BEARING

DEMOUNTABLE BALL BEARING GUIDE PINS



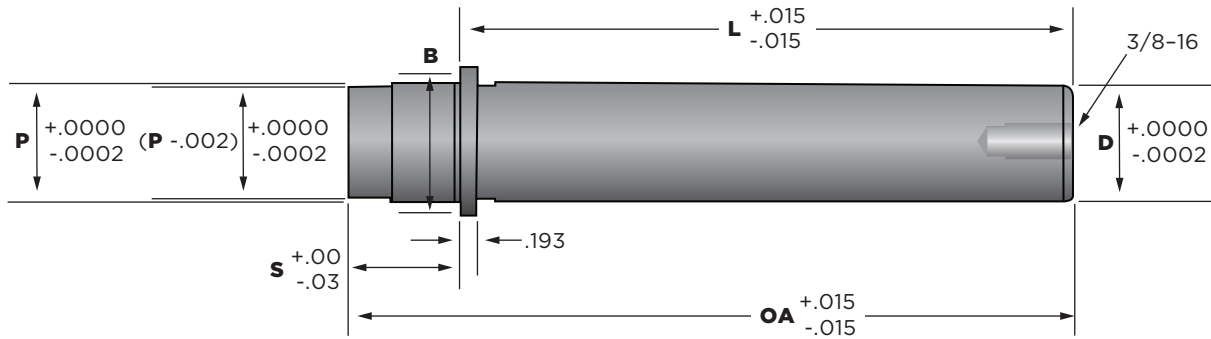
Dia.	D	P	B	S
1"	1.0032	1.0000	1.250	1.19
1-1/4"	1.2532	1.2500	1.500	
1-1/2"	1.5032	1.5000	1.750	1.44
1-3/4"	1.7532	1.7500	2.000	1.69
2"	2.0032	2.0000	2.500	1.94
2-1/2"	2.5032	2.5000	3.000	
3"	3.0032	3.0000	3.500	

"L" Hardened to 60 RC ± 2

L	D = 1"		D = 1-1/4"		D = 1-1/2"		D = 1-3/4"		D = 2"		D = 2-1/2"		D = 3"					
	X2	Part No.	X2	Part No.	X2	Part No.	X2	Part No.	X2	Part No.	X2	Part No.	X2	Part No.				
3.000	.88	332-0812	.88	332-1012	—	—	—	—	—	—	—	—	—	—				
3.250		332-0813		332-1013	—	—	—	—	—	—	—	—	—	—	—			
3.500		332-0814		332-1014	1.12	332-1214	—	—	—	—	—	—	—	—	—			
3.750		332-0815		332-1015		332-1215	—	—	—	—	—	—	—	—	—	—		
4.000	1.38	332-0816	1.38	332-1016	1.12	332-1216	1.38	332-1416	1.62	332-1616	—	—	—	—				
4.250		332-0817		332-1017		332-1217		332-1417		332-1617	—	—	—	—	—	—	—	
4.500		332-0818		332-1018	332-1218	332-1418		332-1618		—	—	—	—	—	—	—		
4.750		332-0819		332-1019	332-1219	332-1419		332-1619		—	—	—	—	—	—	—	—	
5.000		332-0820		332-1020	1.62	332-1220	1.88	332-1420		2.00	332-1620	—	—	—	—	—	—	
5.500		332-0822		332-1022		332-1222		332-1422			332-1622	—	—	—	—	—	—	—
6.000		1.38		332-0824	1.38	332-1024	1.62	332-1224			1.88	332-1424	2.50	332-1624	2.50	332-2024	2.50	332-2424
6.500				332-0826		332-1026		332-1226				332-1426		332-1626		332-2026		332-2426
7.000	332-0828		332-1028	332-1228		332-1428		332-1628	332-2028			332-2428						
7.500	332-0830		332-1030	332-1230		332-1430		332-1630	332-2030			332-2430						
8.000	332-0832		332-1032	332-1232		332-1432		332-1632	332-2032		332-2432							
8.500	—		—	332-1034		332-1234		332-1434	332-1634		332-2034	332-2434						
9.000	—		—	332-1036		332-1236		332-1436	332-1636	332-2036	332-2436							
9.500	—		—	332-1038		332-1238		332-1438	332-1638	332-2038	332-2438							
10.000	—	—	332-1040	332-1240	1.88	332-1440	2.00	332-1640	3.38	332-2040	3.38	332-2440						
11.000	—	—	—	—		332-1444		332-1644		332-2044		332-2444						
12.000	—	—	—	—		332-1448		332-1648		332-2048		332-2448						
13.000	—	—	—	—		—		332-1652		332-2052		332-2452						
14.000	—	—	—	—	—	332-1656	332-2056	332-2456										
15.000	—	—	—	—	—	—	—	332-2060	332-2460									
16.000	—	—	—	—	—	—	—	332-2064	332-2464									

TYPE A — BALL BEARING

DEMOUNTABLE BALL BEARING GUIDE PINS – MAXICAGE™

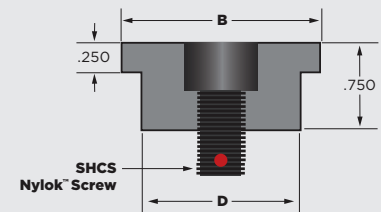


Dia.	D	P	B	S
1"	1.0032	1.0000	1.250	1.19
1-1/4"	1.2532	1.2500	1.500	
1-1/2"	1.5032	1.5000	1.750	1.44
1-3/4"	1.7532	1.7500	2.000	1.69
2"	2.0032	2.0000	2.500	
2-1/2"	2.5032	2.5000	3.000	1.94
3"	3.0032	3.0000	3.500	

"L" Hardened to 60 RC ± 2

Ball Bearing Maxicage™ End Cap				
Pin Dia.	Part No.	D	B	SHCS
3/4"	334-0604	5/8	1	5/16"-18 SHCS
1"	334-0804	7/8	1-1/4	1" LONG
1-1/4"	334-1004	1-1/8	1-1/2	3/8"-16 SHCS 1" LONG
1-1/2"	334-1204	1-3/8	1-3/4	
1-3/4"	334-1404	1-5/8	2	
2"	334-1604	1-7/8	2-3/8	
2-1/2"	334-2004	2-3/8	2-7/8	
3"	334-2404	2-7/8	3-3/8	

For press fit straight & demountable pins.



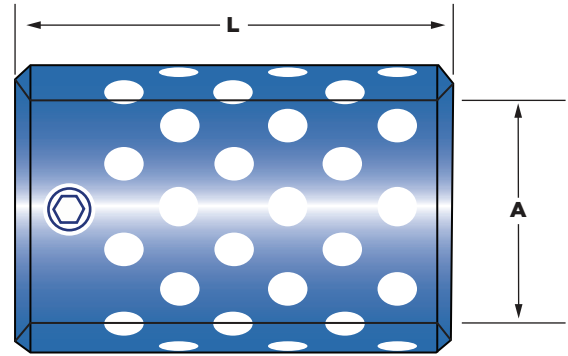
L	D = 1"		D = 1-1/4"		D = 1-1/2"		D = 1-3/4"		D = 2"		D = 2-1/2"		D = 3"	
	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.
3.000	4.19	323M0612	4.19	323M0612	—	—	—	—	—	—	—	—	—	—
3.250	4.44	323M0813	4.44	323M0813	—	—	—	—	—	—	—	—	—	—
3.500	4.69	323M0814	4.69	323M0814	4.94	323M1214	—	—	—	—	—	—	—	—
3.750	4.94	323M0815	4.94	323M0815	5.19	323M1215	—	—	—	—	—	—	—	—
4.000	5.19	323M0816	5.19	323M0816	5.44	323M1216	5.69	323M1416	5.94	323M1616	—	—	—	—
4.250	5.44	323M0817	5.44	323M0817	5.69	323M1217	5.94	323M1417	6.19	323M1617	—	—	—	—
4.500	5.69	323M0818	5.69	323M0818	5.94	323M1218	6.19	323M1418	6.44	323M1618	—	—	—	—
4.750	5.94	323M0819	5.94	323M0819	6.19	323M1219	6.69	323M1419	6.69	323M1619	—	—	—	—
5.000	6.19	323M0820	6.19	323M0820	6.44	323M1220	7.19	323M1420	6.94	323M1620	—	—	—	—
5.500	6.69	323M0822	6.69	323M0822	6.94	323M1222	7.69	323M1422	7.44	323M1622	—	—	—	—
6.000	7.19	323M0824	7.19	323M0824	7.44	323M1224	8.19	323M1424	7.94	323M1624	7.94	323M2024	7.94	323M2424
6.500	7.69	323M0826	7.69	323M0826	7.94	323M1226	8.69	323M1426	8.44	323M1626	8.44	323M2026	8.44	323M2426
7.000	8.19	323M0828	8.19	323M0828	8.44	323M1228	9.19	323M1428	8.94	323M1628	8.94	323M2028	8.94	323M2428
7.500	8.69	323M0830	8.69	323M0830	8.94	323M1230	9.69	323M1430	9.44	323M1630	9.44	323M2030	9.44	323M2430
8.000	9.19	323M0832	9.19	323M0832	9.44	323M1232	10.19	323M1432	9.94	323M1632	9.94	323M2032	9.94	323M2432
8.500	—	—	9.69	323M0834	9.94	323M1234	10.69	323M1434	10.44	323M1634	10.44	323M2034	10.44	323M2434
9.000	—	—	10.19	323M0836	10.44	323M1236	11.19	323M1436	10.94	323M1636	10.94	323M2036	10.94	323M2436
9.500	—	—	10.69	323M0838	10.94	323M1238	11.69	323M1438	11.44	323M1638	11.44	323M2038	11.44	323M2438
10.000	—	—	11.19	323M0840	11.44	323M1240	12.69	323M1440	11.94	323M1640	11.94	323M2040	11.94	323M2440
11.000	—	—	—	—	—	—	13.69	323M1444	12.94	323M1644	12.94	323M2044	12.94	323M2444
12.000	—	—	—	—	—	—	—	323M1448	13.94	323M1648	13.94	323M2048	13.94	323M2448
13.000	—	—	—	—	—	—	—	—	14.94	323M1652	14.94	323M2052	14.94	323M2452
14.000	—	—	—	—	—	—	—	—	15.94	323M1656	15.94	323M2056	15.94	323M2456
15.000	—	—	—	—	—	—	—	—	—	—	16.94	323M2060	16.94	323M2460
16.000	—	—	—	—	—	—	—	—	—	—	17.94	323M2064	17.94	323M2464

TYPE A – BALL BEARING

BALL BEARING CAGES

NOTE:

1. Ball diameter: 3/16", Pin diameter: 1" ≤ 1-3/4"
2. Ball diameter: 1/4", Pin diameter: ≤ 2"
3. Two dog point set screws used on cages ≥ 2" dia.



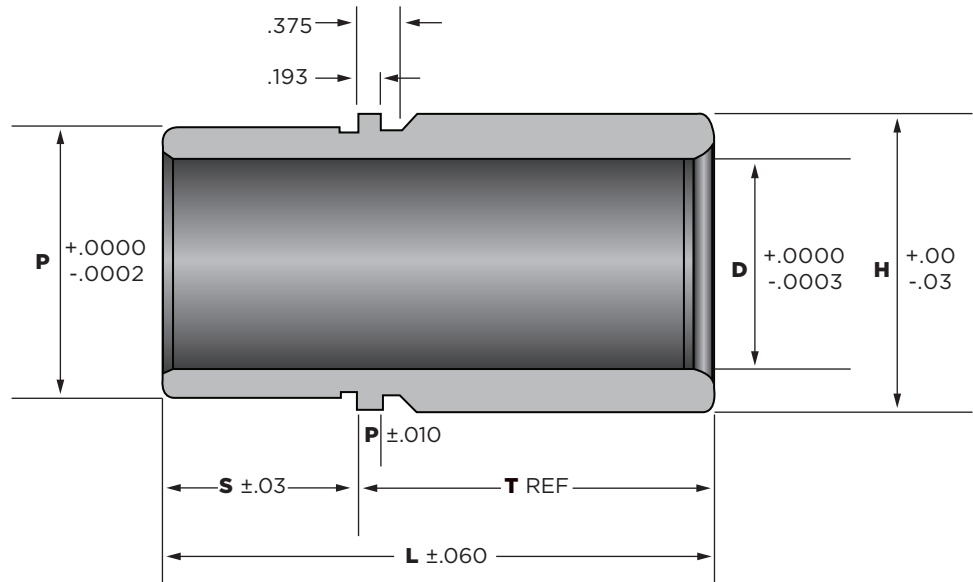
TYPE A – BALL BEARING

Dia.	A	L	Ball Dia.	Part No.
3/4"	.760	1.500	.1875	335-0606
		1.750		335-0607
		2.000		335-0608
		2.250		335-0609
		2.500		335-0610
1"	1.010	1.500	.1875	335-0806
		1.750		335-0807
		2.000		335-0808
		2.250		335-0809
		2.500		335-0810
		3.000		335-0812
1-1/4"	1.260	4.000	.1875	335-0816
		2.000		335-1008
		2.250		335-1009
		2.500		335-1010
		2.750		335-1011
		3.000		335-1012
		3.250		335-1013
		3.500		335-1014
1-1/2"	1.510	3.750	.1875	335-1015
		2.000		335M1208*
		2.500		335-1210
		2.750		335-1211
		3.000		335-1212
		3.250		335-1213
		3.500		335-1214
3.750	335-1215			

Dia.	A	L	Ball Dia.	Part No.
1-3/4"	1.760	2.250	.1875	335MI409*
		3.000		335-1412
		3.250		335-1413
		3.500		335-1414
		3.750		335-1415
		4.000		335-1416
		4.250		335-1417
2"	2.010	2.250	.2500	335MI609*
		2.750		335-1611
		3.000		335-1612
		3.250		335-1613
		3.500		335-1614
		3.750		335-1615
		4.000		335-1616
		4.250		335-1617
2-1/2"	2.510	4.500	.2500	335-1618
		3.250		335-2013
		4.000		335-2016
		4.500		335-2018
		5.000		335-2020
		6.000		335-2024
3"	3.010	7.000	.2500	335-2028
		5.000		335-2420
		6.000		335-2424
		7.000		335-2428

*For Maxicage™ System only.

BALL BEARING DEMOUNTABLE SHOULDER BUSHINGS



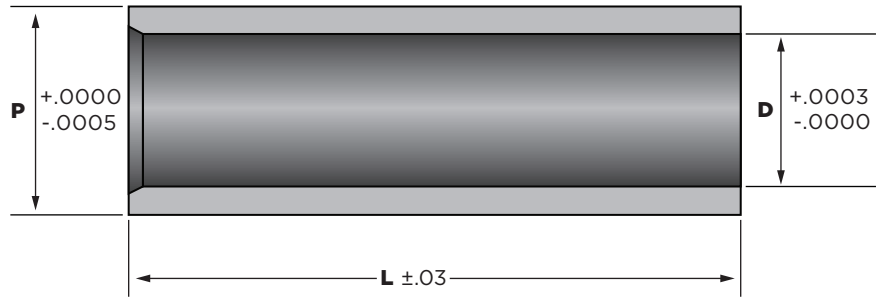
Dia.	D	P	S	H
1"	1.3774	1.7162	1.13	2.00
1-1/4"	1.6274	2.1062	1.38	2.38
1-1/2"	1.8775	2.4362	1.38	2.69
1-3/4"	2.1275	2.7462	1.63	3.00
2"	2.5025	3.1612	1.88	3.56
2-1/2"	3.0025	3.6812	1.88	4.06
3"	3.5025	4.1812	2.38	4.50

Hardened to 60 RC ± 2

Dia.	T = 1"		T = 2"		T = 3"		T = 4"		T = 5"		T = 6"	
	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.
1"	2.125	336-0810	3.125	336-0820	4.125	336-0830	5.125	336-0840	6.125	336-0850	7.125	336-0860
1-1/4"	2.375	336-1010	3.375	336-1020	4.375	336-1030	5.375	336-1040	6.375	336-1050	7.375	336-1060
1-1/2"		336-1210		336-1220		336-1230		336-1240		336-1250		336-1260
1-3/4"	2.625	336-1410	3.625	336-1420	4.625	336-1430	5.625	336-1440	6.625	336-1450	7.625	336-1460
2"	2.875	336-1610	3.875	336-1620	4.875	336-1630	5.875	336-1640	6.875	336-1650	7.875	336-1660
2-1/2"		336-2010		336-2020		336-2030		336-2040		336-2050		336-2060
3"	—	—	4.375	336-2420	5.375	336-2430	6.375	336-2440	7.375	336-2450	8.375	336-2460

TYPE A – BALL BEARING

BALL BEARING PRESS FIT STRAIGHT BUSHINGS

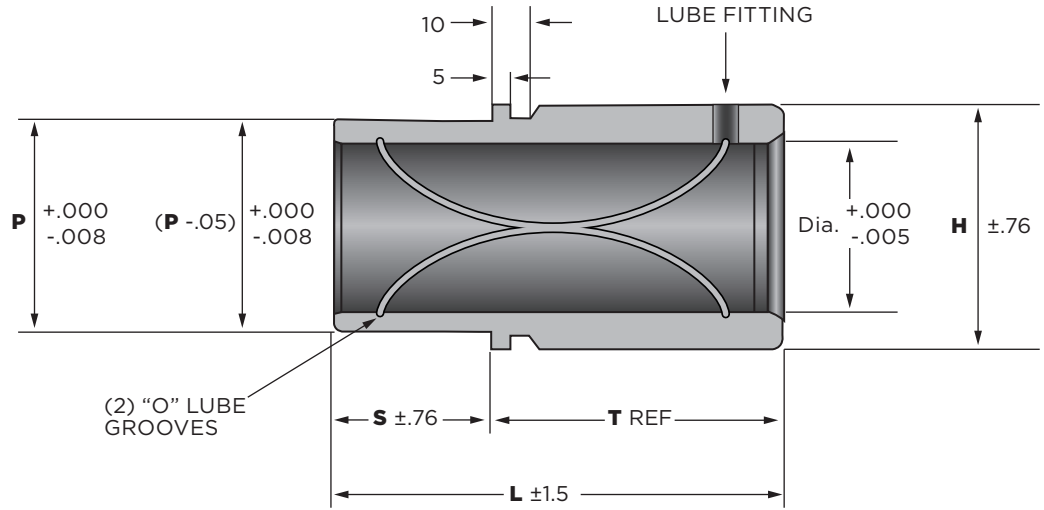


Dia.	D	P
3/4"	1.1270	1.3870
1"	1.3774	1.7180
1-1/4"	1.6274	2.1080
1-1/2"	1.8775	2.4380
1-3/4"	2.1275	2.7480
2"	2.5025	3.1630
2-1/2"	3.0025	3.6830
3"	3.5025	4.1830

Hardened to 60 RC ± 2

L	Dia. = 3/4"	Dia. = 1"	Dia. = 1-1/4"	Dia. = 1-2/4"	Dia. = 1-3/4"	Dia. = 2"	Dia. = 2-1/2"	Dia. = 3"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
1.00	—	—	—	—	—	—	—	—
1.50	—	—	—	—	—	—	—	—
2.00	337-0608	337-0808	—	—	—	—	—	—
2.50	337-0610	337-0810	—	—	—	—	—	—
3.00	337-0612	337-0812	337-1012	337-1212	—	—	—	—
3.50	337-0614	337-0814	337-1014	337-1214	337-1412	337-1612	—	—
4.00	337-0616	337-0816	337-1016	337-1216	337-1414	337-1614	—	—
4.50	337-0618	337-0818	337-1018	337-1218	337-1416	337-1616	—	—
5.00	337-0620	337-0820	337-1020	337-1220	337-1418	337-1618	—	—
5.50	337-0622	337-0822	337-1022	337-1222	337-1420	337-1620	337-2020	—
6.00	—	—	337-1024	337-1224	337-1422	337-1622	337-2022	—
6.50	—	—	337-1026	337-1226	337-1424	337-1624	337-2024	337-2424
7.00	—	—	337-1028	337-1228	337-1426	337-1626	337-2026	337-2426
7.50	—	—	337-1030	337-1230	337-1428	337-1628	337-2028	337-2428
8.00	—	—	337-1032	337-1232	337-1430	337-1630	337-2030	337-2430
8.50	—	—	—	337-1234	337-1432	337-1632	337-2032	337-2432
9.00	—	—	—	337-1236	337-1434	337-1634	337-2034	337-2434
9.50	—	—	—	—	337-1436	337-1636	337-2036	337-2436
10.00	—	—	—	—	337-1438	337-1638	337-2038	337-2438
11.00	—	—	—	—	337-1440	337-1640	337-2040	337-2440
12.00	—	—	—	—	337-1444	337-1644	337-2044	337-2444
13.00	—	—	—	—	—	—	—	337-2448
14.00	—	—	—	—	—	—	—	337-2452
15.00	—	—	—	—	—	—	—	337-2456

DEMOUNTABLE SHOULDER BUSHINGS

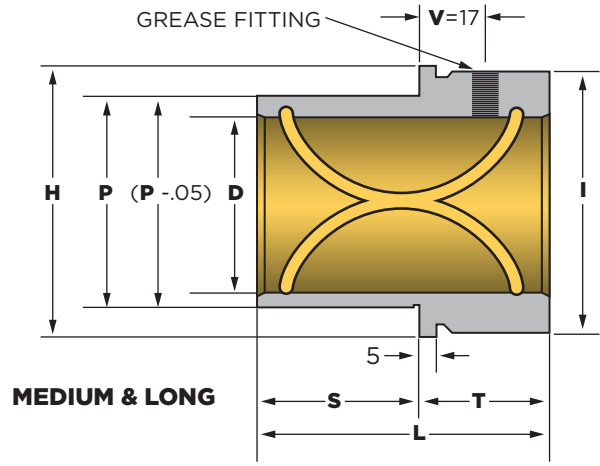
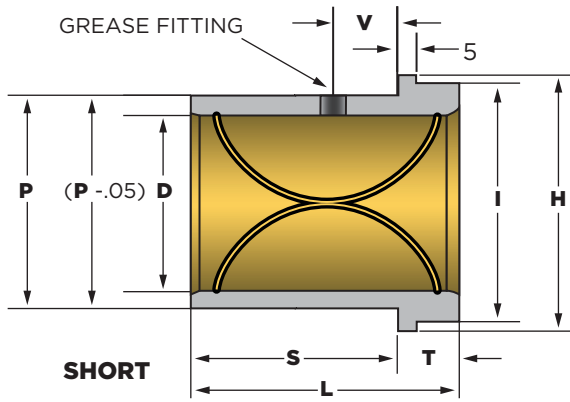


Steel bushings hardened to 60 RC ± 2 on functional areas.

STEEL & BRONZE												
Dia.	P	H	S	T = 25			T = 50			T = 75		
				L	Steel Part No.	Bronze Part No.	L	Steel Part No.	Bronze Part No.	L	Steel Part No.	Bronze Part No.
19mm	28	32	18	43	411-19025	412-19025	68	411-19050	412-19050	93	411-19075	412-19075
25mm	38	43	22	47	411-25025	412-25025	72	411-25050	412-25050	97	411-25075	412-25075
32mm	45	50	25	50	411-32025	412-32025	75	411-32050	412-32050	100	411-32075	412-32075
40mm	54	59	35	60	411-40025	412-40025	85	411-40050	412-40050	110	411-40075	412-40075
44mm	58	65			411-44025	412-44025		411-44050	412-44050		411-44075	412-44075
50mm	65	75	45	70	411-50025	412-50025	95	411-50050	412-50050	120	411-50075	412-50075
63mm	81	91			411-63025	412-63025		411-63050	412-63050		411-63075	412-63075
80mm	100	110			411-80025	412-80025		411-80050	412-80050		411-80075	412-80075

TYPE A – FRICTION

DEMOUNTABLE SHOULDER BUSHINGS



Hardened to 60 RC ± 2 with Bronze-Rite® ID

TYPE A – FRICTION

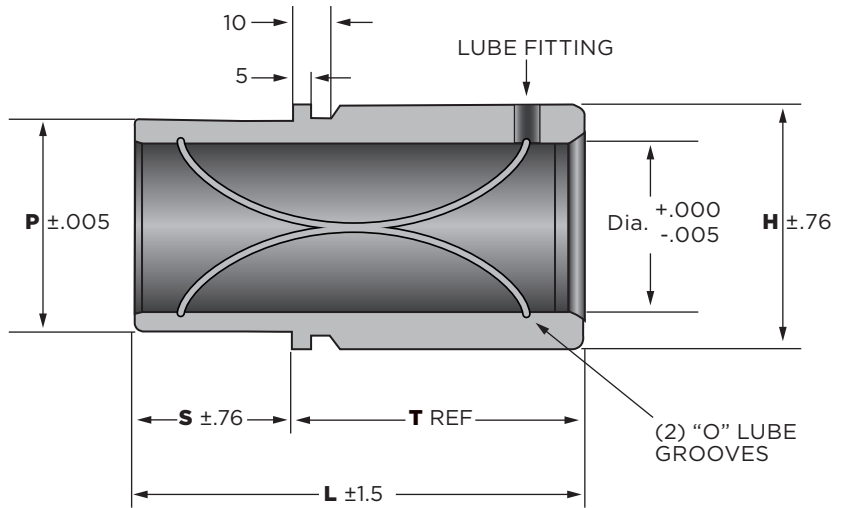
TYPE "L" (BRONZE-RITE®)

Dia.	T = SHORT SHOULDER							Part No.
	P	H	I	S	T	L	V	
19mm	28	34	29	18	13	31	8	413-19025
25mm	38	44	39	23		36	12	413-25025
32mm	45	53	48	30		43	15	413-32025
40mm	54	63	58	36		49	19	413-40025
50mm	65	79	74	46		59		413-50025
63mm	81	92	87	61		74		413-63025
80mm	100	111	106	76		89	413-80025	

Dia.	T = MEDIUM SHOULDER							Part No.
	P	H	I	S	T	L	V	
19mm	28	34	31	18	32	50	17	413-19050
25mm	38	44	41	23	32	55		413-25050
32mm	45	53	50	26	34	60		413-32050
40mm	54	63	60	30	37	67		413-40050
50mm	65	79	76	35	40	75		413-50050
63mm	81	92	89	46	42	88		413-63050
80mm	100	111	108	46	52	98		413-80050

Dia.	T = LONG SHOULDER							Part No.
	P	H	I	S	T	L	V	
19mm	28	34	31	18	52	70	17	413-19075
25mm	38	44	41	23	57	80		413-25075
32mm	45	53	50	26	64	90		413-32075
40mm	54	63	60	30	70	100		413-40075
50mm	65	79	76	35	75	110		413-50075
63mm	81	92	89	46	82	128		413-63075
80mm	100	111	108	46	102	148		413-80075

PRESS FIT SHOULDER BUSHINGS



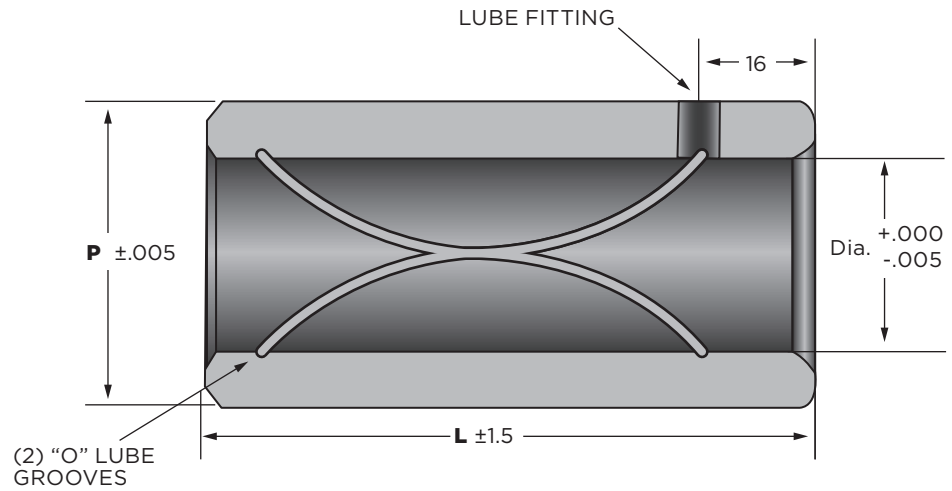
Dia.	P	H
19mm	28.050	32
25mm	38.050	43
32mm	45.050	50
40mm	54.050	59
44mm	58.070	65
50mm	65.070	75
63mm	81.070	91
80mm	100.070	110

Steel bushings hardened to 60 RC ± 2 on functional areas.

STEEL & BRONZE												
Dia.	T = 25				T = 50				T = 75			
	S	L	Steel Part No.	Bronze Part No.	S	L	Steel Part No.	Bronze Part No.	S	L	Steel Part No.	Bronze Part No.
19mm	18	43	414-19025	416-19025	18	68	414-19050	416-19050	18	93	414-19075	416-19075
25mm	22	47	414-25025	416-25025	22	72	414-25050	416-25050	22	97	414-25075	416-25075
32mm	25	50	414-32025	416-32025	25	75	414-32050	416-32050	25	100	414-32075	416-32075
40mm	35	60	414-40025	416-40025	35	85	414-40050	416-40050	35	110	414-40075	416-40075
44mm			414-44025	416-44025			414-44050	416-44050			414-44075	416-44075
50mm	45	70	414-50025	416-50025	45	95	414-50050	416-50050	45	120	414-50075	416-50075
63mm			414-63025	416-63025			414-63050	416-63050			414-63075	416-63075
80mm			414-80025	416-80025			414-80050	416-80050			414-80075	416-80075

TYPE A – FRICTION

PRESS FIT STRAIGHT SLEEVE BUSHINGS

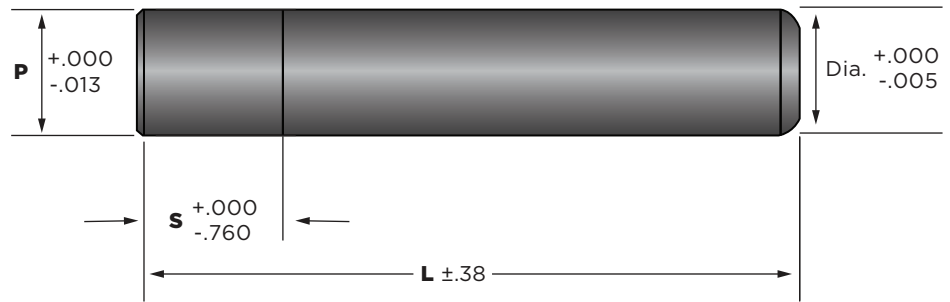


Steel bushings hardened to 60 RC ± 2 on functional areas.

STEEL & BRONZE

Dia.	P	L = 50		L = 65		L = 75	
		Steel Part No.	Bronze Part No.	Steel Part No.	Bronze Part No.	Steel Part No.	Bronze Part No.
19mm	28.050	415-19050	417-19050	415-19065	417-19065	415-19075	417-19075
25mm	38.050	415-25050	417-25050	415-25065	417-25065	415-25075	417-25075
32mm	45.050	415-32050	417-32050	415-32065	417-32065	415-32075	417-32075
40mm	54.050	415-40050	417-40050	415-40065	417-40065	415-40075	417-40075
44mm	58.070	415-44050	417-44050	415-44065	417-44065	415-44075	417-44075
50mm	65.070	415-50050	417-50050	415-50065	417-50065	415-50075	417-50075
63mm	81.070	415-63050	417-63050	415-63065	417-63065	415-63075	417-63075
80mm	100.070	415-80050	417-80050	415-80065	417-80065	415-80075	417-80075

PRESS FIT STRAIGHT GUIDE PINS



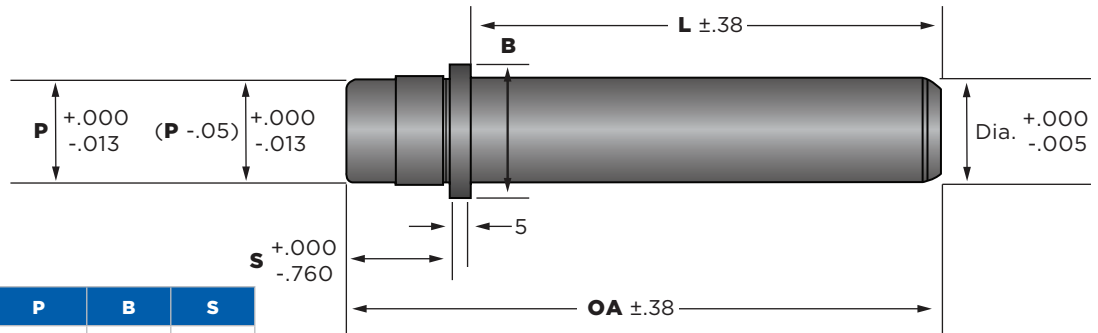
Dia.	P	S
19mm	19.050	32
25mm	25.050	
32mm	32.050	50
40mm	40.050	
50mm	44.070	
63mm	50.070	63
80mm	63.070	80
80mm	80.070	90

Hardened to 60 RC \pm 2

L	Dia. = 19mm	Dia. = 25mm	Dia. = 32mm	Dia. = 40mm	Dia. = 44mm	Dia. = 50mm	Dia. = 63mm	Dia. = 80mm
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
90	421-19090	—	—	—	—	—	—	—
100	421-19100	—	—	—	—	—	—	—
110	421-19110	421-25110	—	—	—	—	—	—
120	421-19120	421-25120	—	—	—	—	—	—
130	421-19130	421-25130	421-32130	421-40130	—	—	—	—
140	421-19140	421-25140	421-32140	421-40140	—	—	—	—
150	421-19150	421-25150	421-32150	421-40150	421-44150	421-50150	—	—
160	421-19160	421-25160	421-32160	421-40160	421-44160	421-50160	—	—
170	421-19170	421-25170	421-32170	421-40170	421-44170	421-50170	—	—
180	421-19180	421-25180	421-32180	421-40180	421-44180	421-50180	—	—
190	421-19190	421-25190	421-32190	421-40190	421-44190	421-50190	—	—
200	421-19200	421-25200	421-32200	421-40200	421-44200	421-50200	421-63200	421-80200
220	—	421-25220	421-32220	421-40220	421-44220	421-50220	421-63220	421-80220
240	—	421-25240	421-32240	421-40240	421-44240	421-50240	421-63240	421-80240
260	—	421-25260	421-32260	421-40260	421-44260	421-50260	421-63260	421-80260
280	—	421-25280	421-32280	421-40280	421-44280	421-50280	421-63280	421-80280
300	—	—	421-32300	421-40300	421-44300	421-50300	421-63300	421-80300
320	—	—	421-32320	421-40320	421-44320	421-50320	421-63320	421-80320
360	—	—	—	421-40360	421-44360	421-50360	421-63360	421-80360
400	—	—	—	—	—	421-50400	421-63400	421-80400
440	—	—	—	—	—	421-50440	421-63440	421-80440
500	—	—	—	—	—	—	421-63500	421-80500

TYPE A – FRICTION

DEMOUNTABLE GUIDE PINS



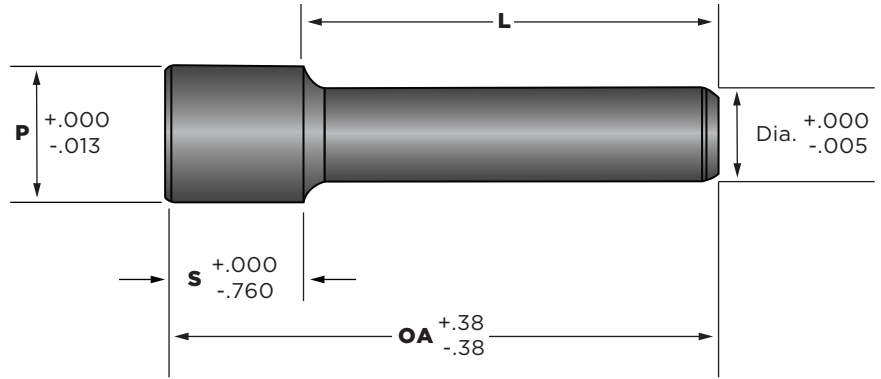
Dia.	D	P	B	S
19mm	19.005	19.050	25	19
25mm	25.005	25.050	32	25
32mm	32.005	32.050	40	32
40mm	40.005	40.050	48	40
44mm	44.005	44.070	57	44
50mm	50.005	50.070	63	50
63mm	63.005	63.070	79	63
80mm	80.005	80.070	93	80

Hardened to 60 RC ± 2

TYPE A – FRICTION

L	Dia. = 19mm		Dia. = 25mm		Dia. = 32mm		Dia. = 40mm		Dia. = 44mm		Dia. = 50mm		Dia. = 63mm		Dia. = 80mm	
	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.
60	79	422-19060	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	89	422-19070	—	—	—	—	—	—	—	—	—	—	—	—	—	—
80	99	422-19080	105	422-25080	—	—	—	—	—	—	—	—	—	—	—	—
90	109	422-19090	115	422-25090	—	—	—	—	—	—	—	—	—	—	—	—
100	119	422-19100	125	422-25100	132	422-32100	140	422-40100	144	422-44100	150	422-50100	—	—	—	—
120	139	422-19120	145	422-25120	152	422-32120	160	422-40120	164	422-44120	170	422-50120	—	—	—	—
130	149	422-19130	155	422-25130	162	422-32130	170	422-40130	174	422-44130	180	422-50130	—	—	—	—
140	159	422-19140	165	422-25140	172	422-32140	180	422-40140	184	422-44140	190	422-50140	—	—	—	—
150	169	422-19150	175	422-25150	182	422-32150	190	422-40150	194	422-44150	200	422-50150	213	422-63150	230	422-80150
160	179	422-19160	185	422-25160	192	422-32160	200	422-40160	204	422-44160	210	422-50160	223	422-63160	240	422-80160
170	189	422-19170	195	422-25170	202	422-32170	210	422-40170	214	422-44170	220	422-50170	233	422-63170	250	422-80170
180	—	—	—	—	212	422-32180	220	422-40180	224	422-44180	230	422-50180	243	422-63180	260	422-80180
190	—	—	—	—	222	422-32190	230	422-40190	234	422-44190	240	422-50190	253	422-63190	270	422-80190
200	—	—	—	—	232	422-32200	240	422-40200	244	422-44200	250	422-50200	263	422-63200	280	422-80200
220	—	—	—	—	252	422-32220	260	422-40220	264	422-44220	270	422-50220	283	422-63220	300	422-80220
240	—	—	—	—	272	422-32240	280	422-40240	284	422-44240	290	422-50240	303	422-63240	320	422-80240
260	—	—	—	—	292	422-32260	300	422-40260	304	422-44260	310	422-50260	323	422-63260	340	422-80260
280	—	—	—	—	312	422-32280	320	422-40280	324	422-44280	330	422-50280	343	422-63280	360	422-80280
300	—	—	—	—	—	—	340	422-40300	344	422-44300	350	422-50300	363	422-63300	380	422-80300
320	—	—	—	—	—	—	360	422-40320	364	422-44320	370	422-50320	383	422-63320	400	422-80320
360	—	—	—	—	—	—	—	—	—	—	410	422-50360	423	422-63360	440	422-80360
400	—	—	—	—	—	—	—	—	—	—	450	422-50400	463	422-63400	480	422-80400
440	—	—	—	—	—	—	—	—	—	—	—	—	503	422-63440	520	422-80440

SHOULDER GUIDE PINS



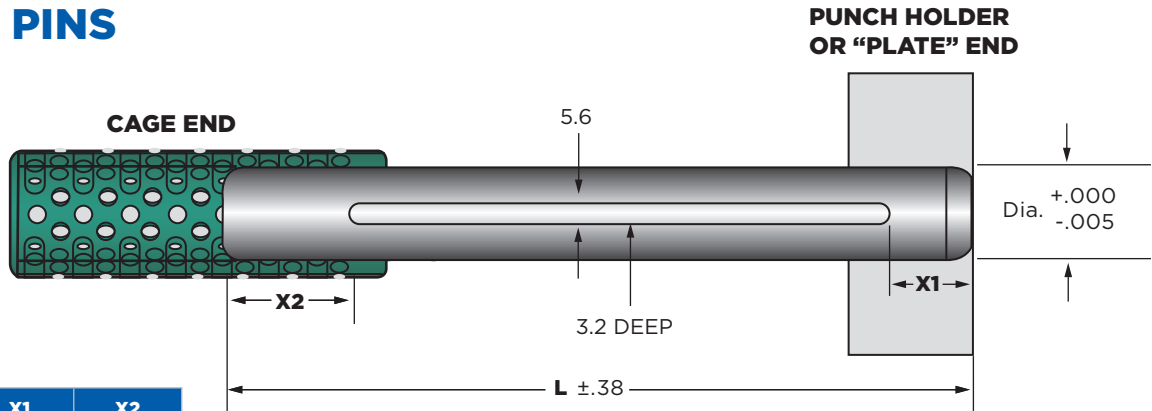
Dia.	P	S
19mm	28.300	25
25mm	38.300	
32mm	45.300	45
40mm	54.300	50
44mm	58.300	60
50mm	65.300	90
63mm	81.300	100
80mm	100.300	

Hardened to 60 RC ± 2

OA	Dia. = 19mm		Dia. = 25mm		Dia. = 32mm		Dia. = 40mm		Dia. = 44mm		Dia. = 50mm		Dia. = 63mm		Dia. = 80mm	
	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.
75	50	423-19075	50	423-25075	—	—	—	—	—	—	—	—	—	—	—	—
90	65	423-19090	65	423-25090	—	—	—	—	—	—	—	—	—	—	—	—
100	75	423-19100	75	423-25100	—	—	—	—	—	—	—	—	—	—	—	—
110	85	423-19110	85	423-25110	65	423-32110	60	423-40110	—	—	—	—	—	—	—	—
120	95	423-19120	95	423-25120	75	423-32120	70	423-40120	60	423-44120	—	—	—	—	—	—
130	105	423-19130	105	423-25130	85	423-32130	80	423-40130	70	423-44130	40	423-50130	—	—	—	—
140	115	423-19140	115	423-25140	95	423-32140	90	423-40140	80	423-44140	50	423-50140	—	—	—	—
150	125	423-19150	125	423-25150	105	423-32150	100	423-40150	90	423-44150	60	423-50150	—	—	—	—
160	—	—	135	423-25160	115	423-32160	110	423-40160	100	423-44160	70	423-50160	—	—	—	—
170	—	—	145	423-25170	125	423-32170	120	423-40170	110	423-44170	80	423-50170	—	—	—	—
180	—	—	155	423-25180	135	423-32180	130	423-40180	120	423-44180	90	423-50180	—	—	—	—
190	—	—	165	423-25190	145	423-32190	140	423-40190	130	423-44190	100	423-50190	—	—	—	—
200	—	—	175	423-25200	155	423-32200	150	423-40200	140	423-44200	110	423-50200	100	423-63200	100	423-80200
220	—	—	195	423-25220	175	423-32220	170	423-40220	160	423-44220	130	423-50220	120	423-63220	120	423-80220
240	—	—	215	423-25240	195	423-32240	190	423-40240	180	423-44240	150	423-50240	140	423-63240	140	423-80240
260	—	—	235	423-25260	215	423-32260	210	423-40260	200	423-44260	170	423-50260	160	423-63260	160	423-80260
280	—	—	—	—	235	423-32280	230	423-40280	220	423-44280	190	423-50280	180	423-63280	180	423-80280
300	—	—	—	—	255	423-32300	250	423-40300	240	423-44300	210	423-50300	200	423-63300	200	423-80300
320	—	—	—	—	275	423-32320	270	423-40320	260	423-44320	230	423-50320	220	423-63320	220	423-80320
360	—	—	—	—	—	—	310	423-40360	300	423-44360	270	423-50360	260	423-63360	260	423-80360
400	—	—	—	—	—	—	—	—	—	—	310	423-50400	300	423-63400	300	423-80400
440	—	—	—	—	—	—	—	—	—	—	350	423-50440	340	423-63440	340	423-80440
500	—	—	—	—	—	—	—	—	—	—	—	—	400	423-63500	400	423-80500

TYPE A – FRICTION

BALL BEARING PRESS FIT STRAIGHT GUIDE PINS



Dia.	X1	X2
19mm		
25mm	22	35
32mm		
40mm	28	41
44mm	35	48
50mm	41	51
63mm	63	86
80mm		

Hardened to 60 RC ± 2

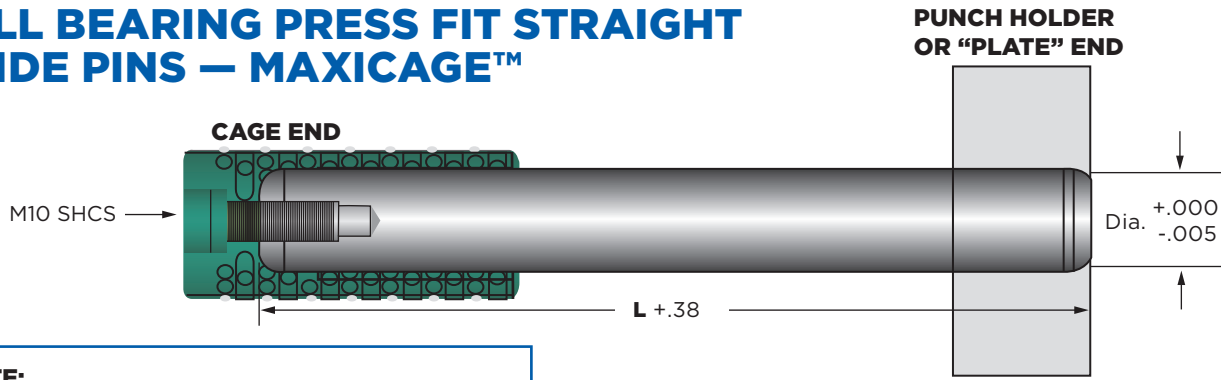
NOTE:

1. Diameters listed are nominal
2. Pin diameters are oversize for correct preload

TYPE A – BALL BEARING

L	Dia. = 19mm	Dia. = 25mm	Dia. = 32mm	Dia. = 40mm	Dia. = 44mm	Dia. = 50mm	Dia. = 63mm	Dia. = 80mm
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
75	431-19075	—	—	—	—	—	—	—
90	431-19090	431-25090	—	—	—	—	—	—
110	431-19110	431-25110	431-32110	431-40110	—	—	—	—
120	431-19120	431-25120	431-32120	431-40120	431-44120	—	—	—
130	431-19130	431-25130	431-32130	431-40130	431-44130	431-50130	—	—
140	431-19140	431-25140	431-32140	431-40140	431-44140	431-50140	—	—
150	431-19150	431-25150	431-32150	431-40150	431-44150	431-50150	—	—
160	431-19160	431-25160	431-32160	431-40160	431-44160	431-50160	—	—
170	—	431-25170	431-32170	431-40170	431-44170	431-50170	—	—
180	—	431-25180	431-32180	431-40180	431-44180	431-50180	—	—
190	—	431-25190	431-32190	431-40190	431-44190	431-50190	—	—
200	—	431-25200	431-32200	431-40200	431-44200	431-50200	431-63200	431-80200
220	—	431-25220	431-32220	431-40220	431-44220	431-50220	431-63220	431-80220
240	—	431-25240	431-32240	431-40240	431-44240	431-50240	431-63240	431-80240
260	—	431-25260	431-32260	431-40260	431-44260	431-50260	431-63260	431-80260
280	—	431-25280	431-32280	431-40280	431-44280	431-50280	431-63280	431-80280
300	—	—	431-32300	431-40300	431-44300	431-50300	431-63300	431-80300
320	—	—	431-32320	431-40320	431-44320	431-50320	431-63320	431-80320
360	—	—	—	431-40360	431-44360	431-50360	431-63360	431-80360
400	—	—	—	—	—	431-50400	431-63400	431-80400
440	—	—	—	—	—	431-50440	431-63440	431-80440
500	—	—	—	—	—	—	431-63500	431-80500

BALL BEARING PRESS FIT STRAIGHT GUIDE PINS – MAXICAGE™

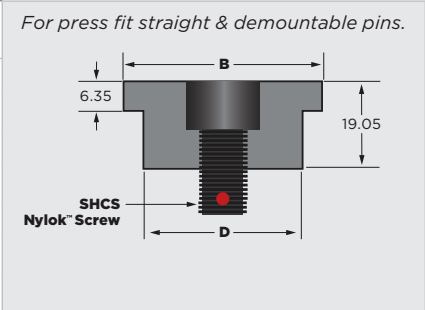


NOTE:
 1. Diameters listed are nominal
 2. Pin diameters are oversize for correct preload

Dia.	X1	X2
19mm	22	35
25mm		
32mm	28	41
40mm		
44mm		
50mm	41	51
63mm	63	86
80mm		

Hardened to 60 RC ± 2

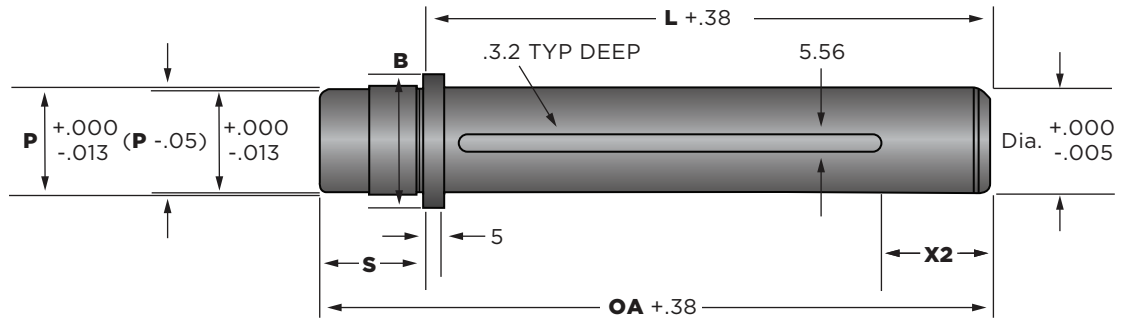
Ball Bearing Maxicage™ End Cap				
Pin Dia.	Part No.	D	B	SHCS
19mm	434-1912	15.88	25.4	M8x1.25 SHCS 25mm LONG
25mm	434-2512	22.23	31.75	M10x1.5 SHCS 25mm LONG
32mm	434-3212	28.58	38.10	
40mm	434-4012	34.93	44.45	
44mm	434-4412	41.28	50.80	
50mm	434-5012	47.63	60.33	
63mm	434-6312	60.33	73.03	
80mm	434-8012	73.03	85.73	



L	Dia. = 19mm	Dia. = 25mm	Dia. = 32mm	Dia. = 40mm	Dia. = 44mm	Dia. = 50mm	Dia. = 63mm	Dia. = 80mm
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
75	431M19075	—	—	—	—	—	—	—
90	431M19090	431M25090	—	—	—	—	—	—
110	431M19110	431M25110	431M32110	431M40110	—	—	—	—
120	431M19120	431M25120	431M32120	431M40120	431M44120	—	—	—
130	431M19130	431M25130	431M32130	431M40130	431M44130	431M50130	—	—
140	431M19140	431M25140	431M32140	431M40140	431M44140	431M50140	—	—
150	431M19150	431M25150	431M32150	431M40150	431M44150	431M50150	—	—
160	431M19160	431M25160	431M32160	431M40160	431M44160	431M50160	—	—
170	—	431M25170	431M32170	431M40170	431M44170	431M50170	—	—
180	—	431M25180	431M32180	431M40180	431M44180	431M50180	—	—
190	—	431M25190	431M32190	431M40190	431M44190	431M50190	—	—
200	—	431M25200	431M32200	431M40200	431M44200	431M50200	431M63200	431M80200
220	—	431M25220	431M32220	431M40220	431M44220	431M50220	431M63220	431M80220
240	—	431M25240	431M32240	431M40240	431M44240	431M50240	431M63240	431M80240
260	—	431M25260	431M32260	431M40260	431M44260	431M50260	431M63260	431M80260
280	—	431M25280	431M32280	431M40280	431M44280	431M50280	431M63280	431M80280
300	—	—	431M32300	431M40300	431M44300	431M50300	431M63300	431M80300
320	—	—	431M32320	431M40320	431M44320	431M50320	431M63320	431M80320
360	—	—	—	431M40360	431M44360	431M50360	431M63360	431M80360
400	—	—	—	—	—	431M50400	431M63400	431M80400
440	—	—	—	—	—	431M50440	431M63440	431M80440
500	—	—	—	—	—	—	431M63500	431M80500

TYPE A – BALL BEARING

DEMOUNTABLE BALL BEARING GUIDE PINS



Dia.	D	P	B	S	X2
19mm	19.076	19.05	25	19	35
25mm	25.081	25.05	32	25	
32mm	32.081	32.05	40	32	
40mm	40.081	40.05	48	40	41
44mm	44.081	44.07	57	44	48
50mm	50.084	50.07	63	50	51
63mm	63.084	63.07	79	63	86
80mm	80.084	80.07	93	80	

"L" Hardened to 60 RC ± 2

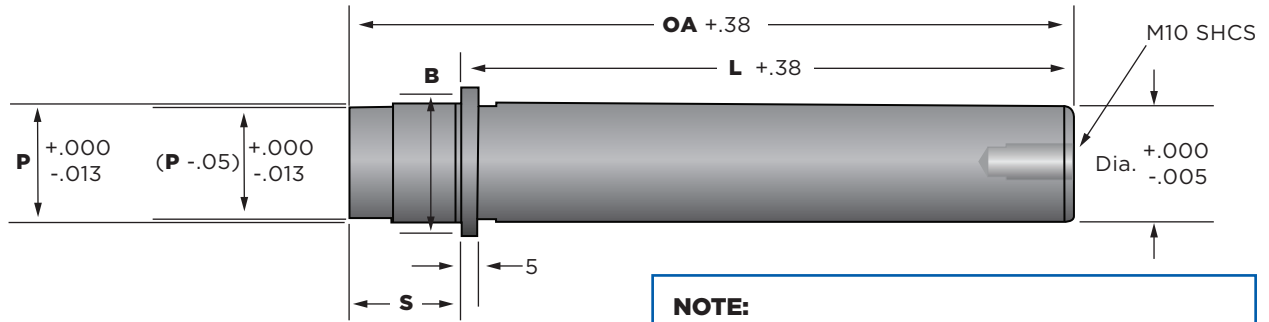
NOTE:

1. Diameters listed are nominal
2. Pin diameters are oversize for correct preload

TYPE A – BALL BEARING

L	Dia. = 19mm		Dia. = 25mm		Dia. = 32mm		Dia. = 40mm		Dia. = 44mm		Dia. = 50mm		Dia. = 63mm		Dia. = 80mm	
	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.
60	79	432-19060	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	89	432-19070	—	—	—	—	—	—	—	—	—	—	—	—	—	—
80	899	432-19080	105	432-25080	—	—	—	—	—	—	—	—	—	—	—	—
90	109	432-19090	115	432-25090	—	—	—	—	—	—	—	—	—	—	—	—
100	119	432-19100	125	432-25100	132	432-32100	140	432-40100	144	432-44100	150	432-50100	—	—	—	—
110	129	432-19110	135	432-25110	142	432-32110	150	432-40110	154	432-44110	160	432-50110	—	—	—	—
120	139	432-19120	145	432-25120	152	432-32120	160	432-40120	164	432-44120	170	432-50120	—	—	—	—
130	149	432-19130	155	432-25130	162	432-32130	170	432-40130	174	432-44130	180	432-50130	—	—	—	—
140	159	432-19140	165	432-25140	172	432-32140	180	432-40140	184	432-44140	190	432-50140	—	—	—	—
150	169	432-19150	175	432-25150	182	432-32150	190	432-40150	194	432-44150	200	432-50150	213	432-63150	230	432-80150
160	179	432-19160	185	432-25160	192	432-32160	200	432-40160	204	432-44160	210	432-50160	223	432-63160	240	432-80160
170	189	432-19170	195	432-25170	202	432-32170	210	432-40170	214	432-44170	220	432-50170	233	432-63170	250	432-80170
180	—	—	—	—	212	432-32180	220	432-40180	224	432-44180	230	432-50180	243	432-63180	260	432-80180
190	—	—	—	—	222	432-32190	230	432-40190	234	432-44190	240	432-50190	253	432-63190	270	432-80190
200	—	—	—	—	232	432-32200	240	432-40200	244	432-44200	250	432-50200	263	432-63200	280	432-80200
220	—	—	—	—	252	432-32220	260	432-40220	264	432-44220	270	432-50220	283	432-63220	300	432-80220
240	—	—	—	—	272	432-32240	280	432-40240	284	432-44240	290	432-50240	303	432-63240	320	432-80240
260	—	—	—	—	292	432-32260	300	432-40260	304	432-44260	310	432-50260	323	432-63260	340	432-80260
280	—	—	—	—	312	432-32280	320	432-40280	324	432-44280	330	432-50280	343	432-63280	260	432-80280
300	—	—	—	—	—	—	340	432-40300	344	432-44300	350	432-50300	363	432-63300	380	432-80300
320	—	—	—	—	—	—	360	432-40320	364	432-44320	370	432-50320	383	432-63320	400	432-80320
360	—	—	—	—	—	—	—	—	—	—	410	432-50360	423	432-63360	440	432-80360
400	—	—	—	—	—	—	—	—	—	—	450	432-50400	463	432-63400	480	432-80400
440	—	—	—	—	—	—	—	—	—	—	—	—	503	432-63440	520	432-80440

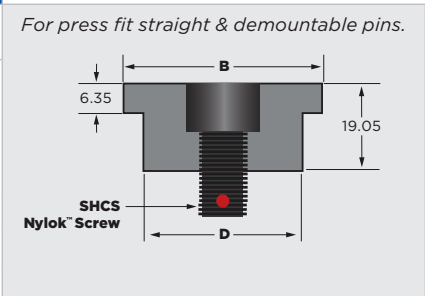
DEMOUNTABLE BALL BEARING GUIDE PINS – MAXICAGE™



NOTE:
 1. Diameters listed are nominal
 2. Pin diameters are oversize for correct preload

Dia.	D	P	B	S
19mm	19.076	19	25	19
25mm	25.081	25	32	25
32mm	32.081	32	40	32
40mm	40.081	40	48	40
44mm	44.081	44	57	44
50mm	50.084	50	63	50
63mm	63.084	63	79	63
80mm	80.084	80	93	80

Ball Bearing Maxicage™ End Cap				
Pin Dia.	Part No.	D	B	SHCS
19mm	434-1912	15.88	25.4	M8x1.25 SHCS 25mm LONG
25mm	434-2512	22.23	31.75	M10x1.5 SHCS 25mm LONG
32mm	434-3212	28.58	38.10	
40mm	434-4012	34.93	44.45	
44mm	434-4412	41.28	50.80	
50mm	434-5012	47.63	60.33	
63mm	434-6312	60.33	73.03	
80mm	434-8012	73.03	85.73	



“L” Hardened to 60 RC ± 2

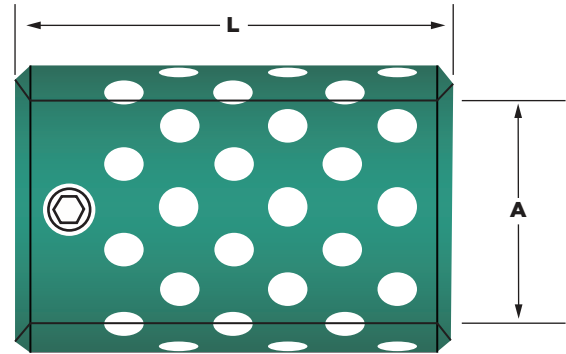
L	Dia. = 19mm		Dia. = 25mm		Dia. = 32mm		Dia. = 40mm		Dia. = 44mm		Dia. = 50mm		Dia. = 63mm		Dia. = 80mm	
	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.	OA	Part No.
60	79	432M19060	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	89	432M19070	—	—	—	—	—	—	—	—	—	—	—	—	—	—
80	899	432M19080	105	432M25080	—	—	—	—	—	—	—	—	—	—	—	—
90	109	432M19090	115	432M25090	—	—	—	—	—	—	—	—	—	—	—	—
100	119	432M19100	125	432M25100	132	432M32100	140	432M40100	144	432M44100	150	432M50100	—	—	—	—
110	129	432M19110	135	432M25110	142	432M32110	150	432M40110	154	432M44110	160	432M50110	—	—	—	—
120	139	432M19120	145	432M25120	152	432M32120	160	432M40120	164	432M44120	170	432M50120	—	—	—	—
130	149	432M19130	155	432M25130	162	432M32130	170	432M40130	174	432M44130	180	432M50130	—	—	—	—
140	159	432M19140	165	432M25140	172	432M32140	180	432M40140	184	432M44140	190	432M50140	—	—	—	—
150	169	432M19150	175	432M25150	182	432M32150	190	432M40150	194	432M44150	200	432M50150	213	432M63150	230	432M80150
160	179	432M19160	185	432M25160	192	432M32160	200	432M40160	204	432M44160	210	432M50160	223	432M63160	240	432M80160
170	189	432M19170	195	432M25170	202	432M32170	210	432M40170	214	432M44170	220	432M50170	233	432M63170	250	432M80170
180	—	—	—	—	212	432M32180	220	432M40180	224	432M44180	230	432M50180	243	432M63180	260	432M80180
190	—	—	—	—	222	432M32190	230	432M40190	234	432M44190	240	432M50190	253	432M63190	270	432M80190
200	—	—	—	—	232	432M32200	240	432M40200	244	432M44200	250	432M50200	263	432M63200	280	432M80200
220	—	—	—	—	252	432M32220	260	432M40220	264	432M44220	270	432M50220	283	432M63220	300	432M80220
240	—	—	—	—	272	432M32240	280	432M40240	284	432M44240	290	432M50240	303	432M63240	320	432M80240
260	—	—	—	—	292	432M32260	300	432M40260	304	432M44260	310	432M50260	323	432M63260	340	432M80260
280	—	—	—	—	312	432M32280	320	432M40280	324	432M44280	330	432M50280	343	432M63280	260	432M80280
300	—	—	—	—	—	—	340	432M40300	344	432M44300	350	432M50300	363	432M63300	380	432M80300
320	—	—	—	—	—	—	360	432M40320	364	432M44320	370	432M50320	383	432M63320	400	432M80320
360	—	—	—	—	—	—	—	—	—	—	410	432M50360	423	432M63360	440	432M80360
400	—	—	—	—	—	—	—	—	—	—	450	432M50400	463	432M63400	480	432M80400
440	—	—	—	—	—	—	—	—	—	—	—	—	503	432M63440	520	432M80440

TYPE A – BALL BEARING

BALL BEARING CAGES

NOTE:

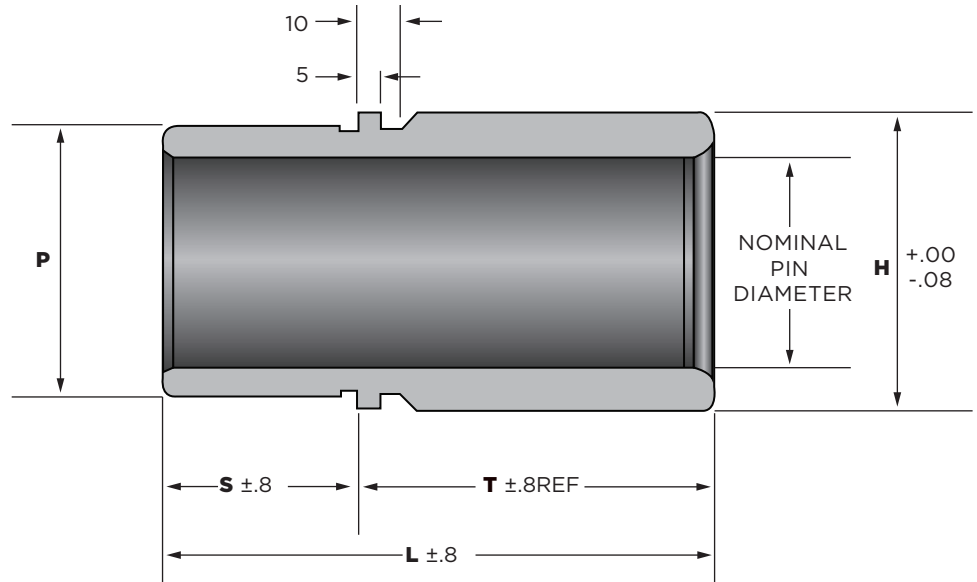
1. Ball diameter: 5mm, Pin diameter: 19mm ≤ 44mm
2. Ball diameter: 7mm, Pin diameter: ≥ 50mm
3. Two dog point set screws used on cages ≥ 50mm dia.


TYPE A – BALL BEARING

Dia.	A	L	Ball Dia.	Part No.
19mm	19.3	40	5	435-19040
		50		435-19050
		65		435-19065
25mm	25.3	40	5	435-25040
		50		435-25050
		65		435-25065
32mm	32.3	60	5	435-32060
		70		435-32070
		75		435-32075
		80		435-32080
		85		435-32085
40mm	40.3	65	5	435-40065
		75		435-40075
		90		435-40090
		95		435-40095

Dia.	A	L	Ball Dia.	Part No.
44mm	44.3	70	7	435-44070
		75		435-44075
		85		435-44085
		90		435-44090
		100		435-44100
50mm	50.3	110	7	435-44110
		85		435-50085
		90		435-50090
		100		435-50100
63mm	63.3	115	7	435-50115
		100		435-63100
		125		435-63125
80mm	80.3	150	7	435-63150
		175		435-63175
		125		435-80125
80mm	80.3	150	7	435-80150
		175		435-80175

BALL BEARING DEMOUNTABLE SHOULDER BUSHINGS



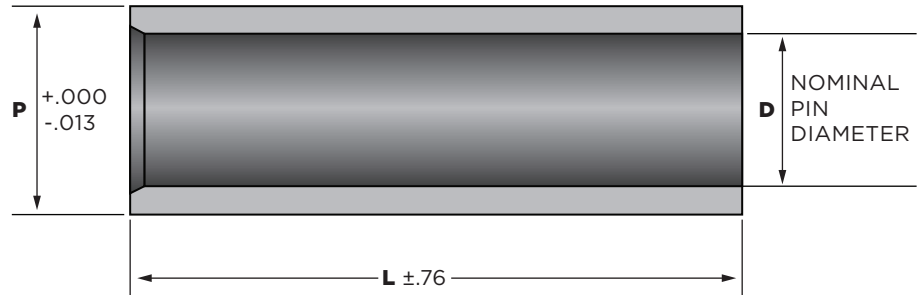
Dia.	P	S	H
19mm	36	30	45
25mm	44	30	51
32mm	54	30	61
40mm	65	35	72
44mm	74	35	81
50mm	81	35	91
63mm	95	35	105
80mm	112	35	122

Hardened to 60 RC ± 2

Dia.	T = 25		T = 50		T = 75		T = 100		T = 125		T = 150	
	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.
19mm		436-19025		436-19050		436-19075	—	—	—	—	—	—
25mm	55	436-25025	80	436-25050	105	436-25075	—	—	—	—	—	—
32mm		436-32025		436-32050		436-32075	130	436-32100	155	436-32125	—	—
40mm	—	—		436-40050		436-40075		436-40100		436-40125	—	—
44mm	—	—	85	436-44050		436-44075		436-44100		436-44125		436-44150
50mm	—	—		436-50050	110	436-50075	135	436-50100	160	436-50125	185	436-50150
63mm	—	—	—	—		436-63075		436-63100		436-63125		436-63150
80mm	—	—	—	—		436-80075		436-80100		436-80125		436-80150

TYPE A – BALL BEARING

BALL BEARING PRESS FIT STRAIGHT BUSHINGS



Dia.	P
19mm	36.05
25mm	44.05
32mm	54.05
40mm	65.05
44mm	74.05
50mm	81.05
63mm	95.05
80mm	112.05

Hardened to 60 RC ± 2

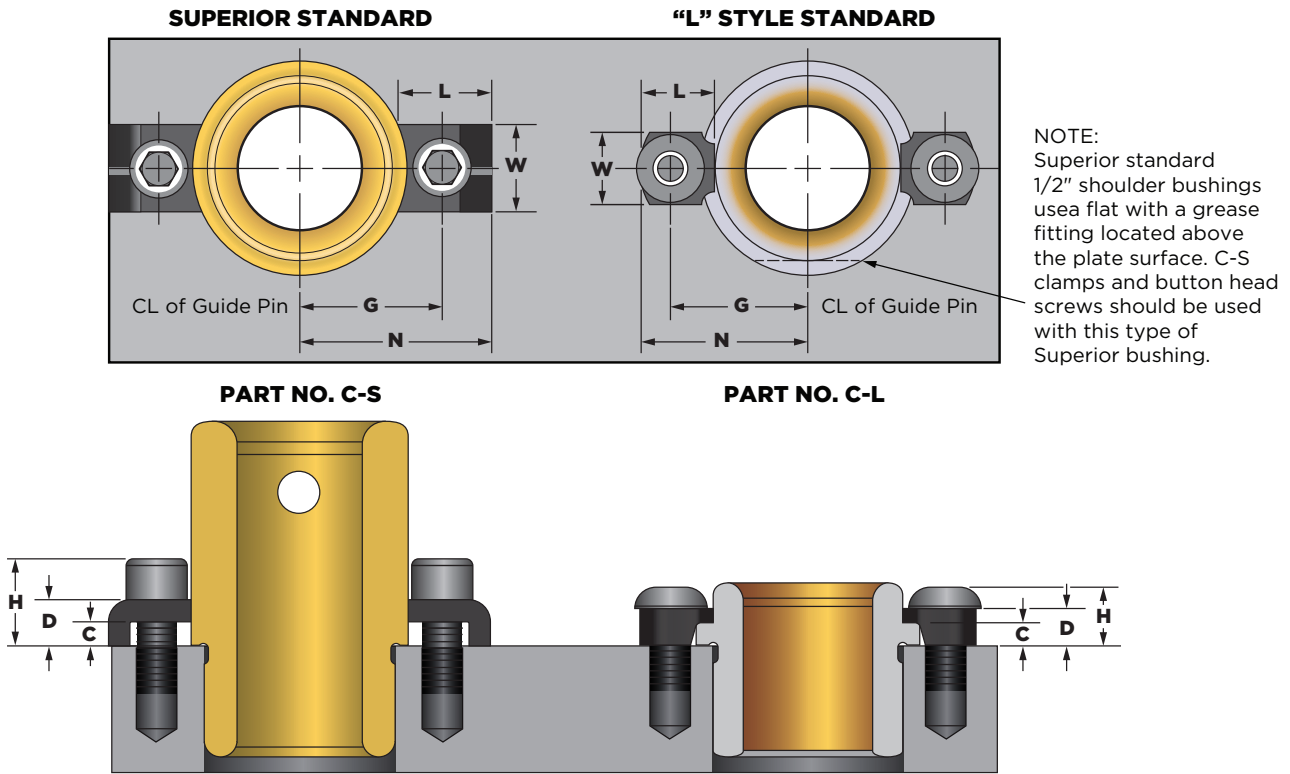
TYPE A — BALL BEARING

L	D = 19mm	D = 25mm	D = 32mm	D = 40mm	D = 44mm	D = 50mm	D = 63mm	D = 80mm
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
50	437-19050	—	—	—	—	—	—	—
65	437-19065	437-25065	—	—	—	—	—	—
75	437-19075	437-25075	437-32075	437-40075	—	—	—	—
90	437-19090	437-25090	437-32090	437-40090	—	—	—	—
100	437-19100	437-25100	437-32100	437-40100	—	—	—	—
115	437-19115	437-25115	437-32115	437-40115	—	—	—	—
125	437-19125	437-25125	437-32125	437-40125	437-44125	437-50125	—	—
140	437-19140	437-25140	437-32140	437-40140	437-44140	437-50140	437-63140	437-80140
150	437-19150	437-25150	437-32150	437-40150	437-44150	437-50150	437-63150	437-80150
165	—	437-25165	437-32165	437-40165	437-44165	437-50165	437-63165	437-80165
175	—	437-25175	437-32175	437-40175	437-44175	437-50175	437-63175	437-80175
190	—	—	—	437-40190	437-44190	437-50190	437-63190	437-80190
200	—	—	—	437-40200	437-44200	437-50200	437-63200	437-80200
215	—	—	—	437-40215	437-44215	437-50215	437-63215	437-80215
230	—	—	—	437-40230	437-44230	437-50230	437-63230	437-80230
250	—	—	—	437-40250	437-44250	437-50250	437-63250	437-80250
280	—	—	—	437-40280	437-44280	437-50280	437-63280	437-80280
300	—	—	—	437-40300	437-44300	437-50300	437-63300	437-80300
330	—	—	—	—	437-44330	437-50330	437-63330	437-80330
500	—	—	—	—	—	—	—	437-80500

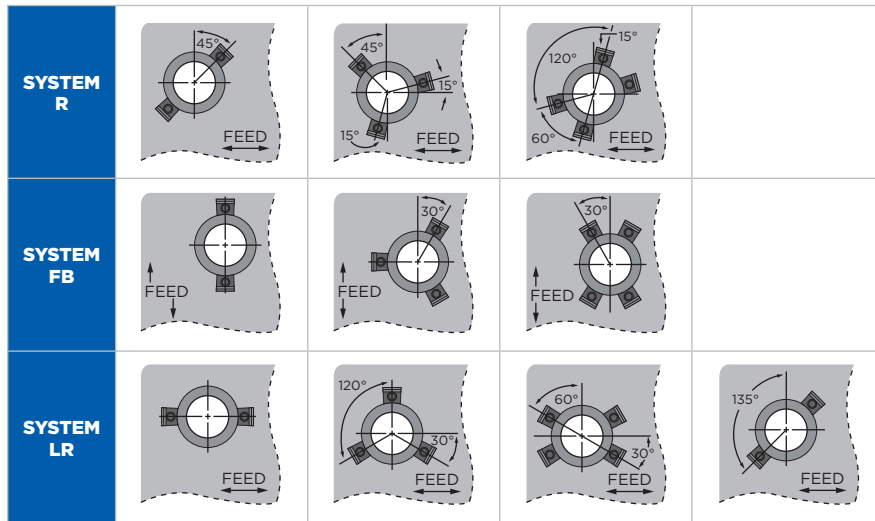
PIN & BUSHING CLAMP LOCATIONS

CLAMPS

Clamps are available in two styles. See chart for specific die set component application. All slip fit demountable guide pins or bushings are supplied with clamps and screws.



When ordering, please specify **Clamp Part Number (C-L or C-S)** and **Clamp Quantity**.



CLAMP LOCATION SYSTEMS

Three clamp location systems are available for Superior die sets. The R, FB and LR systems allow for various material feeding directions and should be considered when ordering any die set. The diagrams to the left show the location of clamps for 1" ball bearing pins and bushings. Special clamp configurations are also available.

TYPE A – PIN & BUSHING

PIN & BUSHING CLAMP LOCATIONS AND BORE SIZES

COMPONENT	Nom. Dia.	Location		Size					Clamp No.	Qty.	Screw Size	Boring Size for Pin or Bushing +.0005/--.0000
	Bush I.D. PIN O.D.	G	N	L	W	C	D	H				
BUSHINGS: Demountable Steel, Superior Bronze-Rite®, Bronze, Shoulder	5/8	0.875	1.260	0.745	0.688	0.188	0.370	0.688	C-S	2	5/16 x 3/4	1.0000
	3/4	0.938	1.322							2		1.1250
	7/8	1.062	1.448							2		1.2500
	1	1.125	1.510							2		1.5000
	1-1/4	1.250	1.635							3		1.7500
	1-1/2	1.375	1.760							3		2.0000
	1-3/4	1.500	1.885							3		2.2500
	2	1.625	2.010							3		2.5000
	2-1/2	1.938	2.323							4		3.1250
	3	2.188	2.573							4		3.6250
BUSHINGS: Demountable Bronze-Rite® Standard All Shoulder Lengths Except Short	3/4	0.859	1.140	0.547	0.562	0.188	0.281	0.447	C-S	2	5/16 x 3/4	1.1250
	7/8	0.984	1.265							2		1.3750
	1	1.078	1.359							3		1.5000
	1-1/4	1.250	1.531							3		1.7500
	1-1/2	1.375	1.656							3		2.0000
	1-3/4	1.500	1.781							3		2.2500
	2	1.765	2.046							4*		2.5000
	2-1/2	2.015	2.296							4		3.0000
	3	2.390	2.671							4		3.6250
BUSHINGS: Demountable Bronze-Rite® Standard Short Shoulder Lengths	3/4	0.859	1.140	0.547	0.562	0.188	0.281	0.447	C-S	2	5/16 x 3/4	1.1250
	7/8	0.984	1.265							2		1.3750
	1	1.078	1.359							3		1.5000
	1-1/4	1.250	1.531							3		1.7500
	1-1/2	1.375	1.656							3		2.0000
	1-3/4	1.500	1.781							3		2.2500
	2	1.672	2.046							4*		2.5000
	2-1/2	1.890	2.296							4		3.0000
	3	2.140	2.671							4		3.6250
BUSHINGS: Demountable Ball Bearing	1	1.250	1.635	0.745	0.688	0.188	0.370	0.688	C-S	2	5/16 x 3/4	1.7160
	1-1/4	1.428	1.813							3		2.1060
	1-1/2	1.593	1.978							3		2.4360
	1-3/4	1.748	2.133							3		2.7460
	2	2.045	2.430							3		3.1610
	2-1/2	2.295	2.680							4		3.6810
	3	2.500	2.885							4		4.1810
GUIDE PINS: Demountable	1	0.875	1.260	0.745	0.688	0.188	0.370	0.688	C-S	2	5/16 x 3/4	1.0000
	1-1/4	1.000	1.385							3		1.2500
	1-1/2	1.125	1.510							3		1.5000
	1-3/4	1.250	1.635							3		1.7500
	2	1.500	1.885							3		2.0000
	2-1/2	1.750	2.135							4		2.5000
	3	2.000	2.385							4		3.0000

* This bushing requires the 3 clamp arrangement whenever the SYSTEM R configuration is chosen.

PIN & BUSHING CLAMP LOCATIONS AND BORE SIZES

COMPONENT	Nom. Dia.	Location		Size					Clamp No.	Qty.	Screw Size	Boring Size for Pin or Bushing +.0127/-.0000
	Bush I.D. PIN O.D.	G	N	L	W	C	D	H				
BUSHINGS: Demountable Steel, Bronze, Shoulder	19mm	23.60	33.39	18.92	17.46	4.76	9.38	17.32	C-S	2	M8-1.25 x 18	28.000
	25mm	28.60	38.39							2		38.000
	32mm	32.10	41.89							3		45.000
	40mm	36.60	46.39							3		54.000
	44mm	39.70	49.49							3		58.000
	50mm	44.70	54.49							3		65.000
	63mm	52.80	62.59							4		81.000
	80mm	62.30	72.09							4		100.000
BUSHINGS: Demountable Bronze-Rite® Standard All Shoulder Lengths Except Short	19mm	22.50	29.64	13.89	14.29	4.76	7.14	11.35	C-LAM	2	M8-1.25 x 18	28.000
	25mm	27.50	34.64							3		38.000
	32mm	32.00	39.14							3		45.000
	40mm	37.00	44.14							3		54.000
	50mm	44.70	52.14							4		65.000
	63mm	51.50	58.64							4		81.000
	80mm	61.00	68.14							4*		100.000
BUSHINGS: Demountable Bronze-Rite® Standard Short Shoulder Lengths	19mm	22.50	29.64	13.89	14.29	4.76	7.14	11.35	C-LAM	2	M8-1.25 x 18	28.000
	25mm	27.50	34.64							3		38.000
	32mm	32.00	39.14							3		45.000
	40mm	37.00	44.14							3		54.000
	50mm	45.00	52.14							4		65.000
	63mm	51.50	58.64							4		81.000
	80mm	61.00	68.14							4		100.000
BUSHINGS: Demountable Ball Bearing	19mm	29.70	39.49	18.92	17.46	4.76	9.38	17.32	C-S	4	M8-1.25 x 18	36.000
	25mm	32.70	42.49							2		44.000
	32mm	37.70	47.49							3		54.000
	40mm	43.20	52.99							3		65.000
	44mm	47.70	57.49							3		74.000
	50mm	52.70	62.49							3		81.000
	63mm	59.70	69.49							4		95.000
	80mm	68.20	77.99							4		112.000
GUIDE PINS: Demountable	19mm	19.50	29.29	18.92	17.46	4.76	9.38	17.32	C-S	2	M8-1.25 x 18	19.000
	25mm	22.50	32.29							3		25.000
	32mm	26.00	35.79							3		32.000
	40mm	30.00	39.79							3		40.000
	44mm	33.00	42.79							3		44.000
	50mm	36.00	45.79							3		50.000
	63mm	44.00	53.79							4		63.000
	80mm	51.00	60.79							4		80.000

* This bushing requires the 3 clamp arrangement whenever the SYSTEM R configuration is chosen.

TYPE A – PIN & BUSHING

PRESS FIT COMPONENT BORE SIZES

Diameter	Bore Size $+0.0005 / -0.0000$		
	Press Fit Guide Pins	Press Fit Shoulder & Sleeve Bushings	Press Fit Ball Bearing Bushings
3/4"	0.7500	1.1250	1.3850
7/8"	0.8750	1.3750	—
1"	1.0000	1.5000	1.7160
1-1/4"	1.2500	1.7500	2.1060
1-1/2"	1.5000	2.0000	2.4360
1-3/4"	1.7500	2.2500	2.7460
2"	2.0000	2.5000	3.1610
2-1/2"	2.5000	3.1250	3.6810
3"	3.0000	3.6250	4.1810

Diameter	Bore Size $+0.0127 / -0.0000$		
	Press Fit Guide Pins	Press Fit Shoulder & Sleeve Bushings	Press Fit Sleeve Ball Bearing Sleeve Bushings
19mm	19.00	28.00	36.00
25mm	25.00	38.00	44.00
32mm	32.00	45.00	54.00
40mm	40.00	54.00	65.00
44mm	44.00	58.00	74.00
50mm	50.00	65.00	81.00
63mm	63.00	81.00	95.00
80mm	80.00	100.00	112.00

TYPE D COMPONENTS

Superior Components D-Style components are manufactured to be direct replacements for competitors' components. This now includes the proprietary Bronze-Rite® process for bronze plated bushings. With thousands of components in stock ready to ship, we are ready for your new tool build or repair.

Type D Components

A complete line of fully-interchangeable Type D style components are in-stock, including:

- Friction Components
 - Demountable and press fit pins
 - Press fit sleeve bushings in steel and self-lubricating materials
 - Demountable bushings in steel, bronze and self-lubricating materials
- Ball Bearing Components
 - Demountable and press fit pins
 - Demountable and press fit sleeve bushings
 - Type 1 and Type 2 ball bearing cages
- Hardware
 - Accessories for ball cages, demountable pins and bushings

Custom Design and Support

Beyond our standard offerings, we provide comprehensive custom design and support services, including:

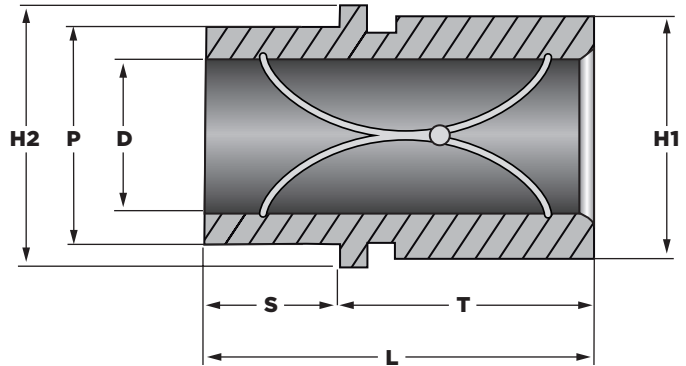
- Tailored solutions to meet your specific needs
- Expert engineering consultation



DEMOUNTABLE SHOULDER BUSHINGS



SHORT - MEDIUM - LONG



TYPE D — FRICTION

Dia.	D	P	H1	H2
3/4"	0.7503	1.1255	1.18	1.30
7/8"	0.8753	1.3755	1.42	1.55
1"	1.0003	1.5005	1.72	1.85
1-1/4"	1.2504	1.7505	1.94	2.10
1-1/2"	1.5005	2.0005	2.19	2.35
1-3/4"	1.7506	2.2505	2.50	2.66
2"	2.0006	2.5005	2.91	3.06
2-1/2"	2.5007	3.2505	3.66	3.81
3"	3.0009	3.7505	4.19	4.28

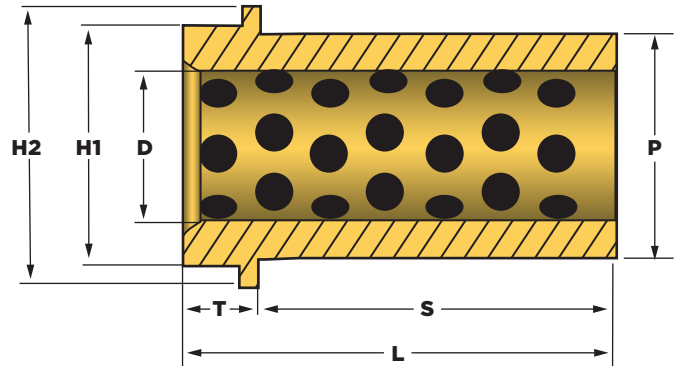
PLAIN-BEARING (STEEL, BRONZE & BRONZE PLATED)

Dia.	T = SHORT					
	T	S	L	Steel Part No.	Solid Bronze Part No.	Bronze Plated Part No.
3/4"	0.750	0.688	1.438	511-0610	Upon Request	
7/8"				511-0710		
1"	0.813	0.938	1.750	511-0810	512-0810	513P0810
1-1/4"		1.125	1.938	511-1010	512-1010	513P1010
1-1/2"		1.188	2.000	511-1210	512-1210	513P1210
1-3/4"	1.000	1.375	2.375	511-1410	512-1410	513P1410
2"		1.625	2.625	511-1610	512-1610	513P1610
2-1/2"		1.875	2.875	511-2010	512-2010	513P2010
3"				511-2410	512-2410	513P2410

PLAIN-BEARING (STEEL, BRONZE & BRONZE PLATED)

Dia.	T = MEDIUM						T = LONG					
	T	S	L	Steel Part No.	Solid Bronze Part No.	Bronze Plated Part No.	T	S	L	Steel Part No.	Solid Bronze Part No.	Bronze Plated Part No.
3/4"	1.750	0.688	2.438	511-0620	Upon Request		Custom Component			Upon Request		
7/8"			2.438	511-0720								
1"	2.000	0.938	2.688	511-0820	512-0820	513P0820	3.000	0.938	3.938	511-0830	512-0830	513P0830
1-1/4"		1.125	3.125	511-1020	512-1020	513P1020		1.125	4.125	511-1030	512-1030	513P1030
1-1/2"		1.188	3.188	511-1220	512-1220	513P1220		1.188	4.188	511-1230	512-1230	513P1230
1-3/4"		1.375	3.375	511-1420	512-1420	513P1420		1.375	4.375	511-1430	512-1430	513P1430
2"		1.625	3.625	511-1620	512-1620	513P1620		1.625	4.625	511-1630	512-1630	513P1630
2-1/2"	2.500	1.875	4.375	511-2020	512-2020	513P2020	1.875	4.875	511-2030	512-2030	513P2030	
3"				511-2420	512-2420	513P2420			511-2430	512-2430	513P2430	

DEMOUNTABLE SHOULDER BUSHINGS



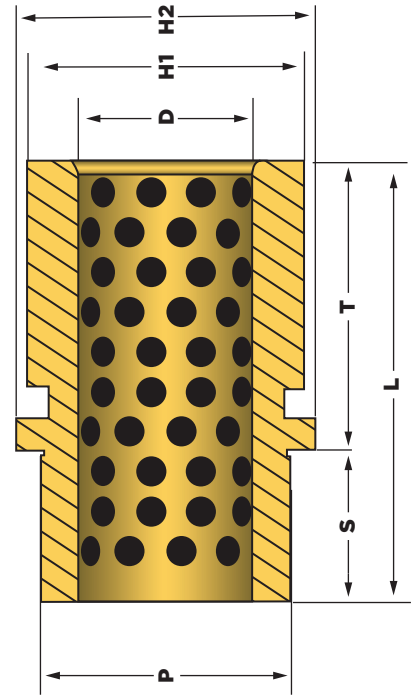
LOW PROFILE - PLAIN-BEARING (SELF-LUBRICATING)								
Dia.	D	P	H1	H2	T	S	L	Part No.
1"	1.0006	1.5005	1.56	1.75	0.500	1.375	1.875	512G0805
						2.375	2.875	512G0805L
1-1/4"	1.2506	1.7505	1.94	2.12	0.500	1.875	2.375	512G1005
						2.875	3.375	512G1005L
1-1/2"	1.5006	2.0005	2.18	2.38	0.500	1.875	2.375	512G1205
						2.875	3.375	512G1205L
1-3/4"	1.7507	2.2505	2.44	2.62	0.500	2.375	2.875	512G1405
						3.375	3.875	512G1405L
2"	2.0007	2.5005	2.75	2.94	0.500	2.375	2.875	512G1605
						3.375	3.875	512G1605L
2-1/2"	2.5012	3.0005	3.18	3.38	0.375	2.625	3.000	512G2005
						3.625	4.000	512G2005L
						4.625	5.000	512G2005XL
3"	3.0014	3.5005	3.68	3.88	0.375	2.625	3.000	512G2405
						3.625	4.000	512G2405L
						4.625	5.000	512G2405XL
						5.625	6.000	512G2405XXL
3-3/4"	3.7518	4.5005	4.68	4.88	0.375	6.625	7.000	512G3005
4-1/2"	4.5025	5.5005	5.68	5.88	0.375	4.625	5.000	512G3605
						7.625	8.000	512G3605L

TYPE D - FRICTION

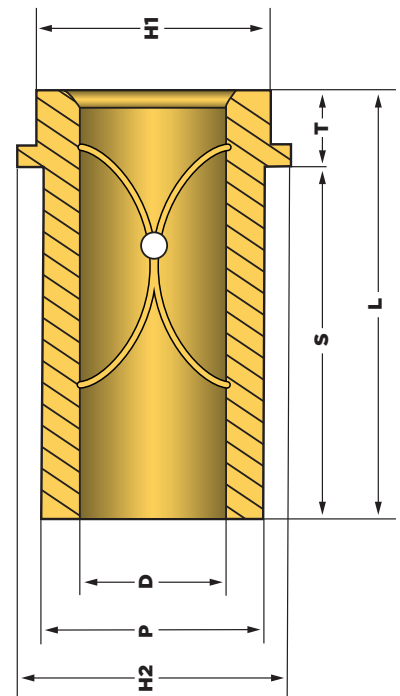
DEMOUNTABLE SHOULDER BUSHINGS

TYPE D — FRICTION

MEDIUM - PLAIN-BEARING (SELF-LUBRICATING)								
Dia.	T	D	P	H1	H2	S	L	Part No.
1"	1.750"	1.0005	1.5000	1.75	1.84	0.938	2.688	512G0820
1-1/4"	2.000"	1.2505	1.7500	1.94	2.10	1.125	3.125	512G1020
1-1/2"		1.5005	2.0000	2.19	2.34	1.188	3.188	512G1220
1-3/4"		1.7506	2.2500	2.50	2.66	1.375	3.375	512G1420
2"	2.500"	2.0006	2.5000	2.91	3.06	1.625	3.625	512G1620
2-1/2"		2.5010	3.2500	3.66	3.81	1.875	4.375	512G2020
3"		3.0012	3.7500	4.12	4.28			512G2420



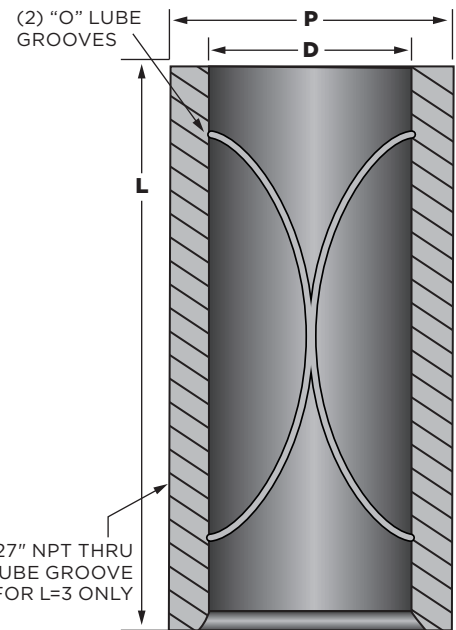
LOW PROFILE - PLAIN-BEARING (BRONZE)								
T = LOW PROFILE ONLY								
Dia.	T	D	P	H1	H2	S	L	Part No.
1"	0.500	1.0003	1.5005	1.59	1.85	0.875	1.375	512-0805
						1.375	1.875	512-0805L
						2.375	2.875	512-0805XL
1-1/4"	0.500	1.2504	1.7505	1.84	2.10	0.875	1.375	512-1005
						1.875	2.375	512-1005L
						2.875	3.375	512-1005XL
1-1/2"	0.500	1.5005	2.0005	2.06	2.35	1.875	2.375	512-1205
						2.875	3.375	512-1205L
						2.375	2.875	512-1405
1-3/4"	0.500	1.7506	2.2505	2.31	2.66	3.375	3.875	512-1405L
						2.375	2.875	512-1605
						3.375	3.875	512-1605L
2"	0.500	2.0006	2.5005	2.63	3.06	2.625	3.125	512-2005
						3.625	4.125	512-2005L
						4.625	5.125	512-2005XL



PRESS FIT SLEEVE BUSHINGS

PLAIN-BEARING						
Dia.	D	P	L = 1-1/2"	L = 1-3/4"	L = 2"	L = 3"
			Part No.	Part No.	Part No.	Part No.
1/2"	0.5002	0.8144	515-0403	—	—	515-0406
5/8"	0.6252	1.0019	515-0503	—	—	515-0506
3/4"	0.7503	1.1269	—	515-06035	—	515-0606
7/8"	0.8753	1.3774	—	515-07035	—	515-0706
1"	1.0003	1.5024	—	515-08035	—	515-0806
1-1/4"	1.2504	1.7524	—	—	515-1004	515-1006
1-1/2"	1.5005	2.0027	—	—	515-1204	515-1206
1-3/4"	1.7506	2.2527	—	—	—	515-1406
2"	2.0006	2.5027	—	—	—	515-1606
2-1/2"	2.5007	3.2537	—	—	—	515-2006

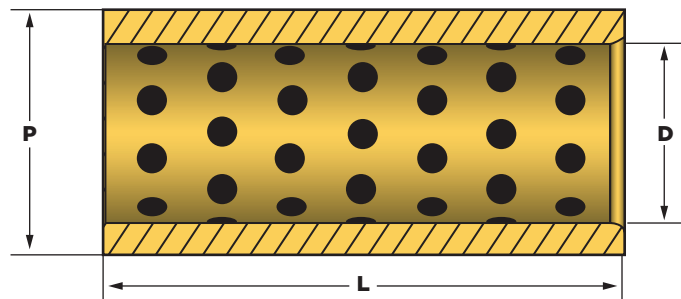
Unfinished Inside Diameter is 0.0006" undersize — available upon request.



1/16-27" NPT THRU INTO LUBE GROOVE FOR L=3 ONLY

PLAIN-BEARING (SELF-LUBRICATING)										
L	NOMINAL ID									
	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/4"	2-1/2"	3"
7/8	517G06-7	—	—	—	—	—	—	—	—	—
1-1/4	—	517G07-10	517G08-10	517G10-10	517G12-10	517G14-10	517G16-10	—	—	—
1-3/8	517G06-11	517G07-11	517G08-11	517G10-11	517G12-11	—	—	—	—	—
1-1/2	517G06-12	517G07-12	517G08-12	517G10-12	517G12-12	517G14-12	517G16-12	517G18-12	517G20-12	—
1-3/4	—	—	517G08-14	517G10-14	517G12-14	517G14-14	—	—	—	—
1-7/8	—	—	—	517G10-15	517G12-15	—	—	—	—	—
2	—	—	517G08-16	517G10-16	517G12-16	517G14-16	517G16-16	517G18-16	517G20-16	517G24-16
2-1/2	—	—	—	—	—	517G14-20	517G16-20	517G18-20	—	517G24-20
3	—	—	517G08-24	517G10-24	517G12-24	517G14-24	517G16-24	517G18-24	517G20-24	517G24-24
3-1/2	—	—	—	—	—	517G14-28	—	—	—	517G24-28
3-7/8	—	—	—	—	—	—	517G16-31	—	—	—
4	—	—	—	—	—	517G14-32	—	—	—	—
4-7/8	—	—	—	—	—	—	—	—	517G20-39	517G24-39

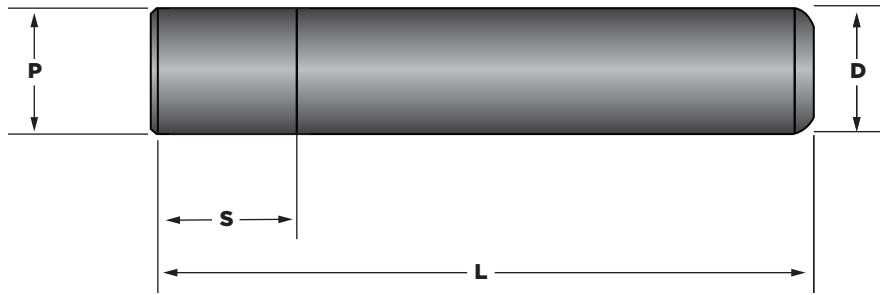
Dia.	D	P
3/4"	0.7505	1.1255
7/8"	0.8755	1.2505
1"	1.0005	1.3755
1-1/4"	1.2505	1.6255
1-1/2"	1.5005	2.0005
1-3/4"	1.7505	2.2505
2"	2.0005	2.5005
2-1/4"	2.2505	2.7505
2-1/2"	2.5005	3.2505
3"	3.0005	3.7505



TYPE D — FRICTION

PRESS FIT STRAIGHT PINS

D (nominal)	P	S
1/2"	0.5017	1.000-1.125*
5/8"	0.6267	1.125
3/4"	0.7520	1.000-1.125*
7/8"	0.8770	1.250
1"	1.0020	1.500
1-1/4"	1.2525	1.750
1-1/2"	1.5025	1.750-2.000**
1-3/4"	1.7525	2.250
2"	2.0025	2.500
2-1/2"	2.5032	3.500
3"	3.0032	3.500



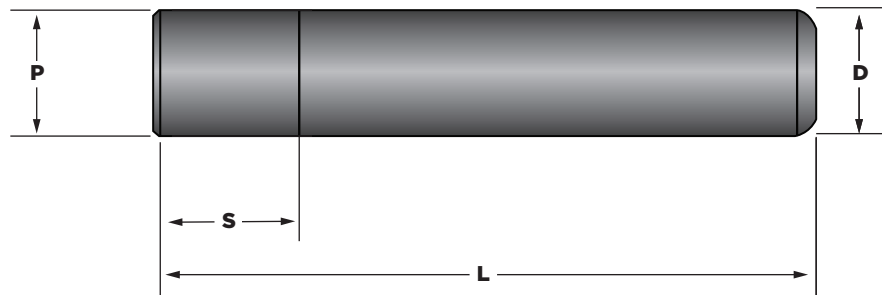
* 1.000 When L = 3-1/2", 1.125 When L ≥ 4"
 ** 1.750 When L ≤ 7", 2.000 When L ≥ 7-1/2"

TYPE D — FRICTION

PLAIN-BEARING													
L	Dia. 1/2"	Dia. 5/8"	Dia. 3/4"	Dia. 7/8"	Dia. 1"	Dia. 1-1/4"	Dia. 1-1/2"	Dia. 1-3/4"	Dia. 2"	Dia. 2-1/2"	Dia. 3"		
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.		
3-1/2	Upon Request	Upon Request	521-0614			—	—	—	—	—	—		
4			521-0616	521-0716	521-0816	—	—	—	—	—	—		
4-1/4			521-0617	521-0717	521-0817	—	—	—	—	—	—		
4-1/2			521-0618	521-0718	521-0818	521-1018	521-1218	—	—	—	—		
4-3/4			521-0619	521-0719	521-0819	521-1019	521-1219	—	—	—	—		
5			521-0620	521-0720	521-0820	521-1020	521-1220	—	—	—	—		
5-1/4			—	521-0721	521-0821	521-1021	521-1221	—	—	—	—		
5-1/2			521-0622	521-0722	521-0822	521-1022	521-1222	—	—	—	—		
5-3/4			—	521-0723	521-0823	521-1023	521-1223	—	—	—	—		
6			—	521-0624	521-0724	521-0824	521-1024	521-1224	521-1424	521-1624	—	—	
6-1/2			—	—	521-0726	521-0826	521-1026	521-1226	521-1426	521-1626	—	—	
7			—	—	521-0628	521-0728	521-0828	521-1028	521-1228	521-1428	521-1628	—	—
7-1/2			—	—	—	521-0730	521-0830	521-1030	521-1230	521-1430	521-1630	—	—
8			—	—	521-0632	521-0732	521-0832	521-1032	521-1232	521-1432	521-1632	521-2032	521-2432
8-1/2			—	—	—	—	521-0834	521-1034	521-1234	521-1434	521-1634	521-2034	521-2434
9	—	—	—	—	521-0836	521-1036	521-1236	521-1436	521-1636	521-2036	521-2436		
10	—	—	—	—	521-0840	521-1040	521-1240	521-1440	521-1640	521-2040	521-2440		
11	—	—	—	—	521-0844	521-1044	521-1244	521-1444	521-1644	521-2044	521-2444		
12	—	—	—	—	521-0848	521-1048	521-1248	521-1448	521-1648	521-2048	521-2448		
13	—	—	—	—	—	—	521-1252	—	521-1652	521-2052	521-2452		
14	—	—	—	—	—	—	521-1256	521-1456	521-1656	521-2056	521-2456		
15	—	—	—	—	—	—	521-1260	—	—	—	—		
17	—	—	—	—	—	—	—	—	521-1668	521-2068	521-2468		
20	—	—	—	—	—	—	—	—	521-1680	521-2080	521-2480		

PRESS FIT STRAIGHT PINS

D (nominal)	P	S
1/2"	0.5017	1.000-1.125*
5/8"	0.6267	1.125
3/4"	0.7520	1.000-1.125*
7/8"	0.8770	1.250
1"	1.0020	1.500
1-1/4"	1.2525	1.750
1-1/2"	1.5025	1.750-2.000**
1-3/4"	1.7525	2.250
2"	2.0025	2.500
2-1/2"	2.5032	3.500
3"	3.0032	3.500



* 1.000 When L = 3-1/2", 1.125 When L ≥ 4"
 ** 1.750 When L ≤ 7", 2.000 When L ≥ 7-1/2"

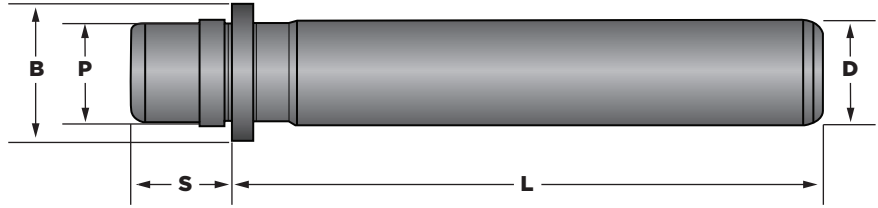
PLAIN-BEARING (CHROME PLATED)

L	Dia. 1/2"	Dia. 5/8"	Dia. 3/4"	Dia. 7/8"	Dia. 1"	Dia. 1-1/4"	Dia. 1-1/2"	Dia. 1-3/4"	Dia. 2"	Dia. 2-1/2"	Dia. 3"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
3-1/2	521C0414	—	521C0614	—	—	—	—	—	—	—	—
4	521C0416	521C0516	521C0616	521C0716	521C0816	—	—	—	—	—	—
4-1/4	521C0417	521C0517	521C0617	521C0717	521C0817	—	—	—	—	—	—
4-1/2	521C0418	521C0518	521C0618	521C0718	521C0818	—	—	—	—	—	—
4-3/4	521C0419	521C0519	521C0619	521C0719	521C0819	521C1019	521C1219	—	—	—	—
5	521C0420	521C0520	521C0620	521C0720	521C0820	521C1020	521C1220	—	—	—	—
5-1/4	521C0421	—	—	521C0721	521C0821	521C1021	521C1221	—	—	—	—
5-1/2	521C0422	521C0522	521C0622	521C0722	521C0822	521C1022	521C1222	—	—	—	—
5-3/4	—	—	—	521C0723	521C0823	521C1023	521C1223	—	—	—	—
6	—	521C0524	521C0624	521C0724	521C0824	521C1024	521C1224	521C1424	521C1624	—	—
6-1/2	—	—	—	521C0726	521C0826	521C1026	521C1226	521C1426	521C1626	—	—
7	—	—	—	521C0728	521C0828	521C1028	521C1228	521C1428	521C1628	—	—
7-1/2	—	—	—	521C0730	521C0830	521C1030	521C1230	521C1430	521C1630	—	—
8	—	—	—	521C0732	521C0832	521C1032	521C1232	521C1432	521C1632	521C2032	521C2432
8-1/2	—	—	—	—	521C0834	521C1034	521C1234	521C1434	521C1634	521C2034	521C2434
9	—	—	—	—	521C0836	521C1036	521C1236	521C1436	521C1636	521C2036	521C2436
10	—	—	—	—	521C0840	521C1040	521C1240	521C1440	521C1640	521C2040	521C2440
11	—	—	—	—	521C0844	521C1044	521C1244	521C1444	521C1644	521C2044	521C2444
12	—	—	—	—	521C0848	521C1048	521C1248	521C1448	521C1648	521C2048	521C2448
13	—	—	—	—	—	—	—	—	521C1652	521C2052	521C2452
14	—	—	—	—	—	—	—	521C1456	521C1656	521C2056	521C2456
15	—	—	—	—	—	—	—	—	—	—	—
17	—	—	—	—	—	—	—	—	521C1668	521C2068	521C2468
20	—	—	—	—	—	—	—	—	521C1680	521C2080	521C2480

TYPE D – FRICTION

DEMOUNTABLE PINS

D (nominal)	P	B	S
7/8"	0.8760	1.188	0.938
1"	1.0010	1.313	1.188
1-1/4"	1.2510	1.563	1.188
1-1/2"	1.5010	1.875	1.563
1-3/4"	1.7511	2.250	1.688
2"	2.0011	2.500	1.938
2-1/2"	2.5011	3.031	1.938
3"	3.0010	3.500	2.438



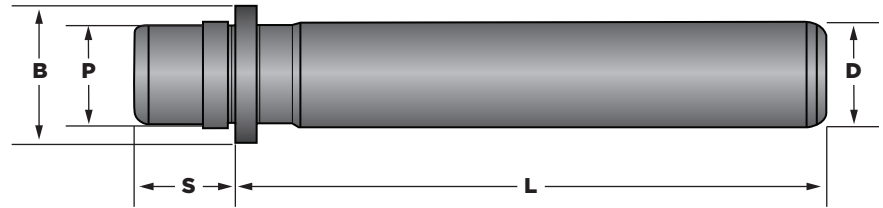
PLAIN-BEARING

L	Dia. 7/8"	Dia. 1"	Dia. 1-1/4"	Dia. 1-1/2"	Dia. 1-3/4"	Dia. 2"	Dia. 2-1/2"	Dia. 3"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
2-1/2	—	522-0810	—	—	—	—	—	—
2-3/4	522-0711	522-0811	522-1011	522-1211	—	—	—	—
3	522-0712	522-0812	522-1012	522-1212	—	—	—	—
3-1/4	522-0713	522-0813	522-1013	522-1213	—	—	—	—
3-1/2	522-0714	522-0814	522-1014	522-1214	522-1414	522-1614	—	—
3-3/4	522-0715	522-0815	522-1015	522-1215	—	—	—	—
4	522-0716	522-0816	522-1016	522-1216	522-1416	522-1616	—	—
4-1/4	522-0717	522-0817	522-1017	522-1217	—	—	—	—
4-1/2	522-0718	522-0818	—	—	522-1418	522-1618	522-2018	522-2418
4-3/4	522-0719	—	522-1019	522-1219	—	—	—	—
5	—	522-0820	—	—	522-1420	522-1620	522-2020	522-2420
5-1/4	522-0721	—	522-1021	522-1221	—	—	—	—
5-1/2	—	522-0822	—	—	522-1422	522-1622	522-2022	522-2422
5-3/4	522-0723	—	522-1023	522-1223	—	—	—	—
6	—	522-0824	—	—	522-1424	522-1624	—	—
6-1/4	522-0725	—	522-1025	522-1225	—	—	—	—
6-1/2	—	522-0826	—	—	522-1426	522-1626	522-2026	522-2426
6-3/4	522-0727	—	522-1027	522-1227	—	—	—	—
7	—	522-0828	—	—	—	—	—	—
7-1/4	—	—	522-1029	522-1229	—	—	—	—
7-1/2	—	522-0830	—	—	522-1430	522-1630	522-2030	522-2430
8-1/4	—	—	522-1033	522-1233	—	—	—	—
8-1/2	—	—	—	—	522-1434	522-1634	522-2034	522-2434
9-1/4	—	—	522-1037	522-1237	—	—	—	—
9-1/2	—	—	—	—	522-1438	522-1638	522-2038	522-2438
10-1/4	—	—	522-1041	522-1241	—	—	—	—
10-1/2	—	—	—	—	—	522-1642	522-2042	522-2442
11-1/2	—	—	—	—	522-1446	522-1646	—	—
13-1/2	—	—	—	—	—	—	522-2054	522-2454
14-1/2	—	—	—	—	—	522-1658	—	—
16-1/2	—	—	—	—	—	—	522-2066	522-2466
17-1/2	—	—	—	—	—	522-1670	—	—

TYPE D — FRICTION

DEMOUNTABLE PINS

D (nominal)	P	B	S
7/8"	0.8760	1.188	0.938
1"	1.0010	1.313	1.188
1-1/4"	1.2510	1.563	1.188
1-1/2"	1.5010	1.875	1.563
1-3/4"	1.7511	2.250	1.688
2"	2.0011	2.500	1.938
2-1/2"	2.5011	3.031	1.938
3"	3.0010	3.500	2.438



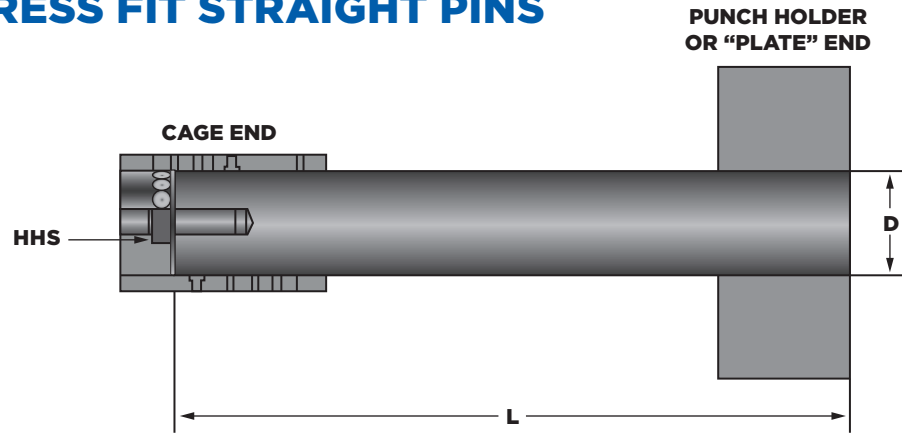
PLAIN-BEARING (CHROME COATED)								
L	Dia. 7/8"	Dia. 1"	Dia. 1-1/4"	Dia. 1-1/2"	Dia. 1-3/4"	Dia. 2"	Dia. 2-1/2"	Dia. 3"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
2-1/2	—	522C0810	—	—	—	—	—	—
2-3/4	522C0711	522C0811	522C1011	522C1211	—	—	—	—
3	522C0712	522C0812	522C1012	522C1212	—	—	—	—
3-1/4	522C0713	522C0813	522C1013	522C1213	—	—	—	—
3-1/2	522C0714	522C0814	522C1014	522C1214	522C1414	522C1614	—	—
3-3/4	522C0715	522C0815	522C1015	522C1215	—	—	—	—
4	522C0716	522C0816	522C1016	522C1216	522C1416	522C1616	—	—
4-1/4	522C0717	522C0817	522C1017	522C1217	—	—	—	—
4-1/2	522C0718	522C0818	—	—	522C1418	522C1618	522C2018	522C2418
4-3/4	522C0719	—	522C1019	522C1219	—	—	—	—
5	—	522C0820	—	—	522C1420	522C1620	522C2020	522C2420
5-1/4	522C0721	—	522C1021	522C1221	—	—	—	—
5-1/2	—	522C0822	—	—	522C1422	522C1622	522C2022	522C2422
5-3/4	522C0723	—	522C1023	522C1223	—	—	—	—
6	—	522C0824	—	—	522C1424	522C1624	—	—
6-1/4	522C0725	—	522C1025	522C1225	—	—	—	—
6-1/2	—	522C0826	—	—	522C1426	522C1626	522C2026	522C2426
6-3/4	522C0727	—	522C1027	522C1227	—	—	—	—
7	—	522C0828	—	—	—	—	—	—
7-1/4	—	—	522C1029	522C1229	—	—	—	—
7-1/2	—	522C0830	—	—	522C1430	522C1630	522C2030	522C2430
8-1/4	—	—	522C1033	522C1233	—	—	—	—
8-1/2	—	—	—	—	522C1434	522C1634	522C2034	522C2434
9-1/4	—	—	522C1037	522C1237	—	—	—	—
9-1/2	—	—	—	—	522C1438	522C1638	522C2038	522C2438
10-1/4	—	—	522C1041	522C1241	—	—	—	—
10-1/2	—	—	—	—	—	522C1642	522C2042	522C2442
11-1/2	—	—	—	—	522C1446	522C1646	—	—
13-1/2	—	—	—	—	—	—	522C2054	522C2454
14-1/2	—	—	—	—	—	522C1658	—	—
16-1/2	—	—	—	—	—	—	522C2066	522C2466
17-1/2	—	—	—	—	—	522C1670	—	—

TYPE D – FRICTION

BALL BEARING PRESS FIT STRAIGHT PINS

D (nominal)	HHS
1"	5/16"-18
1-1/4"	
1-1/2"	3/8"-16
1-3/4"	
2"	1/2"-13
2-1/2"	
3"	

Hardened to 60 ± 2 Rc



TYPE D — BALL BEARING

L	Dia. 1"	Dia. 1-1/4"	Dia. 1-1/2"	Dia. 1-3/4"	Dia. 2"	Dia. 2-1/2"	Dia. 3"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
3-1/4	531-0813	—	—	—	—	—	—
3-3/4	531-0815	—	—	—	—	—	—
4-1/4	531-0817	531-1017	531-1217	—	—	—	—
4-1/2	531-0818	—	—	—	—	—	—
4-3/4	531-0819	531-1019	—	—	—	—	—
5	531-0820	—	531-1220	531-1420	—	—	—
5-1/4	531-0821	531-1021	—	—	—	—	—
5-1/2	531-0822	531-1022	—	—	—	—	—
5-3/4	531-0823	531-1023	531-1223	531-1423	531-1623	—	—
6	531-0824	531-1024	531-1224	—	—	—	—
6-1/2	531-0826	531-1026	531-1226	531-1426	531-1626	—	—
7	531-0828	531-1028	531-1228	531-1428	—	—	—
7-1/4	—	—	—	—	531-1629	—	—
7-1/2	531-0830	531-1030	531-1230	531-1430	531-1630	—	—
7-3/4	—	—	—	—	531-1631	—	—
8	531-0832	531-1032	531-1232	531-1432	531-1632	531-2032	—
8-1/2	531-0834	531-1034	531-1234	531-1434	531-1634	—	531-2434
8-3/4	—	—	—	—	—	531-2035	—
9	531-0836	531-1036	531-1236	531-1436	531-1636	—	—
9-1/4	—	—	—	—	—	—	531-2437
9-1/2	—	—	531-1238	531-1438	531-1638	531-2038	—
10	—	531-1040	531-1240	531-1440	531-1640	531-2040	531-2440
10-1/2	—	—	531-1242	531-1442	531-1642	—	—
11	—	531-1044	531-1244	531-1444	531-1644	531-2044	531-2444
11-1/2	—	—	531-1246	531-1446	531-1646	—	—
12	—	531-1048	531-1248	531-1448	531-1648	531-2048	531-2448
12-1/2	—	—	531-1250	531-1450	531-1650	—	—
13	—	—	531-1252	531-1452	531-1652	531-2052	531-2452
14	—	—	531-1256	531-1456	531-1656	531-2056	531-2456
15	—	—	—	531-1460	531-1660	—	—
16	—	—	—	—	531-1664	—	—
17	—	—	—	531-1468	531-1668	531-2068	531-2468
18	—	—	—	—	531-1672	531-2072	—
20	—	—	—	—	—	531-2080	531-2480

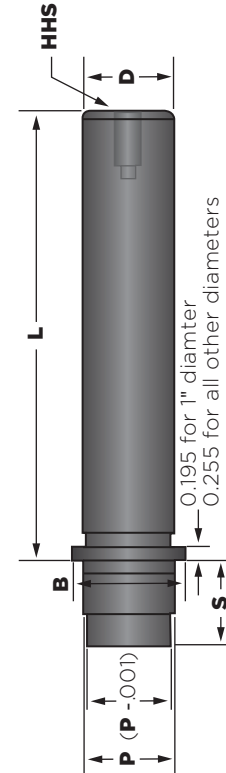
BALL BEARING DEMOUNTABLE PINS

D (nominal)	P	B	S	HHS
1"	1.0000	1.313	1.188	5/16"-18
1-1/4"	1.2500	1.563		
1-1/2"	1.5000	1.875	1.438	3/8"-16
1-3/4"	1.7500	2.250	1.688	
2"	2.0000	2.500	1.938	
2-1/2"	2.5000	3.031	2.438	1/2"-13
3"	3.0000	3.500		

Hardened to 60 ± 2 Rc

L	Dia. 1"	Dia. 1-1/4"	Dia. 1-1/2"
	Part No.	Part No.	Part No.
2-1/2	532-0810	—	—
2-3/4	532-0811	—	—
3	532-0812	—	—
3-1/4	532-0813	532-1013	532-1213
3-1/2	532-0814	532-1014	532-1214
3-3/4	532-0815	532-1015	532-1215
4	532-0816	532-1016	532-1216
4-1/4	532-0817	532-1017	532-1217
4-1/2	532-0818	532-1018	532-1218
4-3/4	532-0819	532-1019	—
5	—	—	532-1220
5-1/4	532-0821	532-1021	—
5-1/2	—	—	532-1222
5-3/4	532-0823	532-1023	—
6	—	—	532-1224
6-1/4	532-0825	532-1025	—
6-1/2	—	—	532-1226
6-3/4	532-0827	532-1027	—
7	—	—	532-1228
7-1/4	532-0829	532-1029	—
7-1/2	—	—	532-1230
7-3/4	532-0831	532-1031	—
8	—	—	532-1230
8-1/2	—	—	532-1234
8-3/4	—	532-1035	—
9	—	—	532-1236
9-1/2	—	—	532-1238
9-3/4	—	532-1039	—
10	—	—	532-1240
10-1/2	—	—	532-1242
10-3/4	—	532-1043	—
11	—	—	532-1244
11-1/2	—	—	532-1246
12-1/2	—	—	532-1250

L	Dia. 1-3/4"	Dia. 2"
	Part No.	Part No.
3-3/4	532-1415	—
4	532-1416	—
4-1/4	532-1417	532-1617
4-1/2	532-1418	532-1618
4-3/4	532-1419	532-1619
5	—	532-1620
5-1/4	532-1421	532-1621
5-1/2	—	532-1622
5-3/4	532-1423	532-1623
6	—	532-1624
6-1/4	532-1425	—
6-1/2	—	532-1626
6-3/4	532-1427	—
7	—	532-1628
7-1/4	532-1429	—
7-1/2	—	532-1630
7-3/4	532-1431	—
8	—	532-1632
8-1/4	532-1433	—
8-1/2	—	532-1634
8-3/4	532-1435	—
9	—	532-1636
9-1/4	532-1437	—
9-1/2	—	532-1638
9-3/4	532-1439	—
10	—	532-1640
10-1/4	532-1441	—
10-1/2	—	532-1642
10-3/4	532-1443	—
11	—	532-1644
11-1/4	532-1445	—
12	—	532-1648
12-1/4	532-1449	—
13	—	532-1652
13-1/4	532-1453	—
14	—	532-1656
14-1/4	532-1457	—
15	—	532-1660
15-1/4	532-1461	—
16	—	532-1664



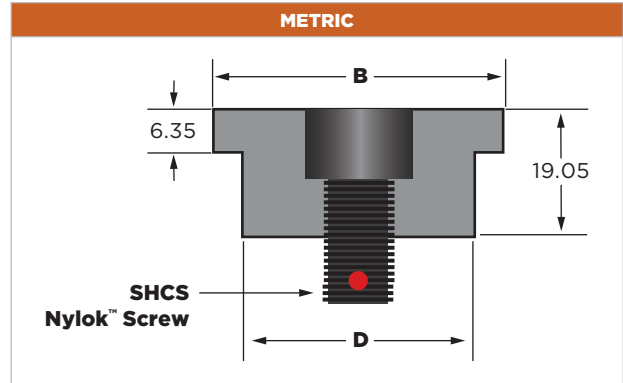
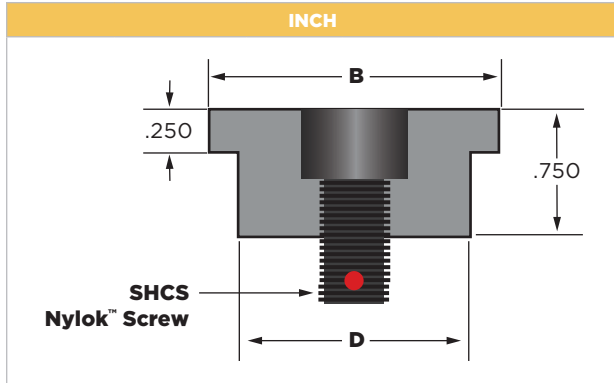
L	Dia. 2-1/2"	Dia. 3"
	Part No.	Part No.
6	532-2024	532-2424
6-1/2	532-2026	532-2426
7	532-2028	—
7-1/2	—	532-2430
8	532-2032	—
8-1/2	—	532-2434
9	532-2036	—
9-1/2	—	532-2438
10	532-2040	—
10-1/2	—	532-2442
11	532-2044	—
11-1/2	—	532-2446
12	532-2048	—
12-1/2	—	532-2450
13	532-2052	—
13-1/2	—	532-2454
14	532-2056	—
14-1/2	—	532-2458
15	532-2060	—
17-1/2	—	532-2470
18	532-2072	—

TYPE D – BALL BEARING

BALL BEARING MAXICAGE™ END CAP

End Cap Dimensions for:

Ball bearing Maxicage™ Type D press fit straight pins and Type D demountable pins



Pin Dia.	Part No.	D	B	SHCS
1"	534-0804	7/8	1-1/4	5/16"-18 SHCS 1" LONG
1-1/4"	534-1004	1-1/8	1-1/2	
1-1/2"	534-1204	1-3/8	1-3/4	3/8"-16 SHCS 1" LONG
1-3/4"	534-1404	1-5/8	2	
2"	534-1604	1-7/8	2-3/8	1/2"-13 SHCS 1" LONG
2-1/2"	534-2004	2-3/8	2-7/8	
3"	534-2404	2-7/8	3-3/8	

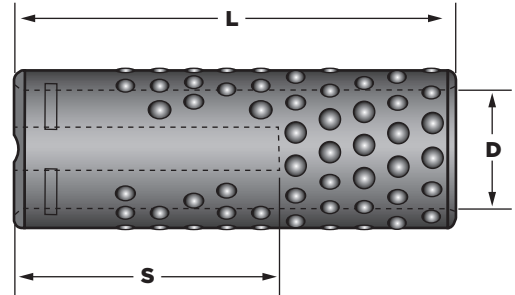
Pin Dia.	Part No.	D	B	SHCS
25mm	634-2512	22.23	31.75	M6 x 1.0 SHCS 20mm LONG
32mm	634-3212	28.58	38.10	
40mm	634-4012	34.93	44.45	M6 x 1.5 SHCS 25mm LONG
50mm	634-5012	47.63	60.33	
63mm	634-6312	60.33	73.03	
80mm	634-8012	73.03	85.73	

TYPE D — BALL BEARING

BALL BEARING CAGES

NOTE:

1. Ball diameter: 3/16", Pin diameter: 1" ≤ 1-3/4"
2. Ball diameter: 1/4", Pin diameter: ≤ 2"



BALL BEARING CAGES — DIAMETER 1"-1-3/4"					
D (nominal)	L	S	Ball Dia.	Part No.	
1"	1.500	0.44	.1875	535-0806-1	
	2.000			0.69	535-0808-1
				1.06	535-0808-2
	2.500	1.31		535-0810-2	
	3.000	1.56		535-0812-2	
	3.250	1.81		535-0813-2	
	3.500	2.06		535-0814-2	
	3.750	2.31		535-0815-2	
1-1/4"	1.500	0.44	.1875	535-1006-1	
	2.000	0.69		535-1008-1	
	2.750	1.44		535-1011-2	
	3.250	1.69		535-1013-2	
	3.750	1.94		535-1015-2	
	4.000	2.19		535-1016-2	
	4.250	2.44		535-1017-2	
	4.750	2.94		535-1019-2	
1-1/2"	2.000	0.69	.1875	535-1208-1	
	2.500	0.94		535-1210-1	
	2.750	1.44		535-1211-2	
	3.500	1.81		535-1214-2	
	4.250	2.19		535-1217-2	
	4.500	2.44		535-1218-2	
	5.000	2.94		535-1220-2	
	5.500	3.44		535-1222-2	
1-3/4"	2.500	0.94	.1875	535-1410-1	
	3.000	1.19		535-1412-1	
	3.250	1.69		535-1413-2	
	4.000	2.06		535-1416-2	

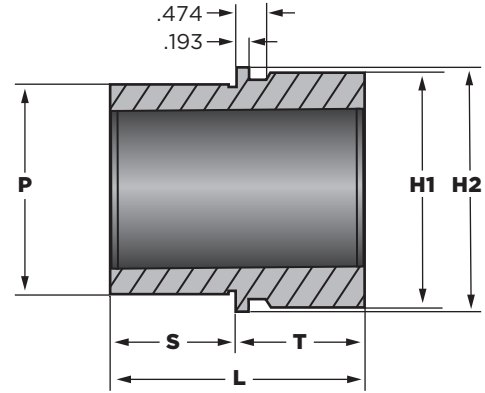
BALL BEARING CAGES — DIAMETER 1-3/4"-3"				
D (nominal)	L	S	Ball Dia.	Part No.
1-3/4"	4.750	2.44	.1875	535-1419-2
	5.250	2.94		535-1421-2
	5.750	3.44		535-1423-2
	6.250	3.94		535-1425-2
	6.750	4.44		535-1427-2
	2"	3.000		1.19
3.500		1.44	535-1614-1	
3.750		1.94	535-1615-2	
4.500		2.31	535-1618-2	
5.250		2.69	535-1621-2	
5.625		3.06	535-1623-2	
6.000		3.44	535-1624-2	
6.500		3.94	535-1626-2	
2-1/2"	7.000	4.44	.2500	535-1628-2
	7.500	4.94		535-1630-2
	4.000	1.69		535-2016-1
	5.750	3.00		535-2023-2
	6.500	3.38		535-2026-2
	7.250	3.75		535-2029-2
	7.750	4.25		535-2031-2
	8.250	4.75		535-2033-2
3"	8.750	5.25	.2500	535-2035-2
	4.000	1.69		535-2416-1
	5.750	3.00		535-2423-2
	6.500	3.38		535-2426-2
	7.25	3.75		535-2429-2
	7.75	4.25		535-2431-2
	8.25	4.75		535-2433-2
	8.75	5.25		535-2435-2

TYPE D — BALL BEARING

BALL BEARING DEMOUNTABLE BUSHINGS

Dia.	P	S	H1	H2
1"	1.8750	1.188	2.13	2.28
1-1/4"	2.1250		2.38	2.53
1-1/2"	2.5000	1.438	2.88	3.03
1-3/4"	2.7500	1.688	3.13	3.28
2"	3.2500	1.938	3.63	3.78
2-1/2"	3.7500		4.13	4.28
3"	4.2500		4.75	4.91

Hardened to 60 ± 2 Rc



TYPE D — BALL BEARING

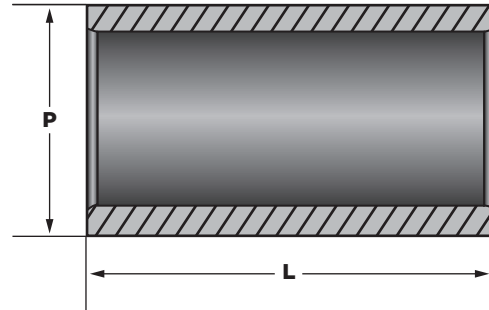
Dia.	T = 1-1/4"		T = 1-1/2"		T = 1-3/4"		T = 2"		T = 2-1/4"	
	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.
1"	2.438	536-0811	—	—	2.938	536-0813	—	—	3.438	536-0821
1-1/4"	—	—	—	—	2.938	536-1013	—	—	3.938	536-1021
1-1/2"	—	—	2.938	536-1212	—	—	—	—	3.688	536-1221
1-3/4"	—	—	—	—	3.438	536-1413	—	—	—	—
2"	—	—	2.938	536-1612	—	—	3.938	536-1620	—	—
2-1/2"	—	—	3.438	536-2012	—	—	3.938	536-2020	—	—
3"	—	—	—	—	—	—	3.938	536-2420	—	—

Dia.	T = 2-1/2"		T = 2-3/4"		T = 3"		T = 3-1/4"		T = 3-1/2"	
	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.
1"	—	—	3.938	536-0823	—	—	—	—	—	—
1-1/4"	—	—	3.938	536-1023	—	—	—	—	—	—
1-1/2"	—	—	—	—	4.438	536-1230	—	—	4.938	536-1232
1-3/4"	4.188	536-1422	—	—	—	—	4.938	536-1431	—	—
2"	—	—	4.688	536-1623	—	—	—	—	5.438	536-1632
2-1/2"	—	—	—	—	4.938	536-2030	—	—	—	—
3"	—	—	—	—	4.938	536-2430	—	—	—	—

Dia.	T = 4"		T = 4-1/4"		T = 4-3/4"		T = 5"		T = 5-1/2"	
	L	Part No.	L	Part No.	L	Part No.	L	Part No.	L	Part No.
1"	—	—	—	—	—	—	—	—	—	—
1-1/4"	—	—	—	—	—	—	—	—	—	—
1-1/2"	—	—	—	—	—	—	—	—	—	—
1-3/4"	—	—	—	—	—	—	—	—	—	—
2"	—	—	6.188	536-1641	—	—	6.938	536-1650	—	—
2-1/2"	5.938	536-2040	—	—	6.688	536-2043	—	—	7.438	536-2052
3"	5.938	536-2440	—	—	6.688	536-2443	—	—	7.438	536-2452

BALL BEARING SLEEVE BUSHINGS

Dia.	P
1"	1.8750
1-1/4"	2.1250
1-1/2"	2.5000
1-3/4"	2.7500
2"	3.2500
2-1/2"	3.7500
3"	4.2500



Hardened to 60 ± 2 Rc

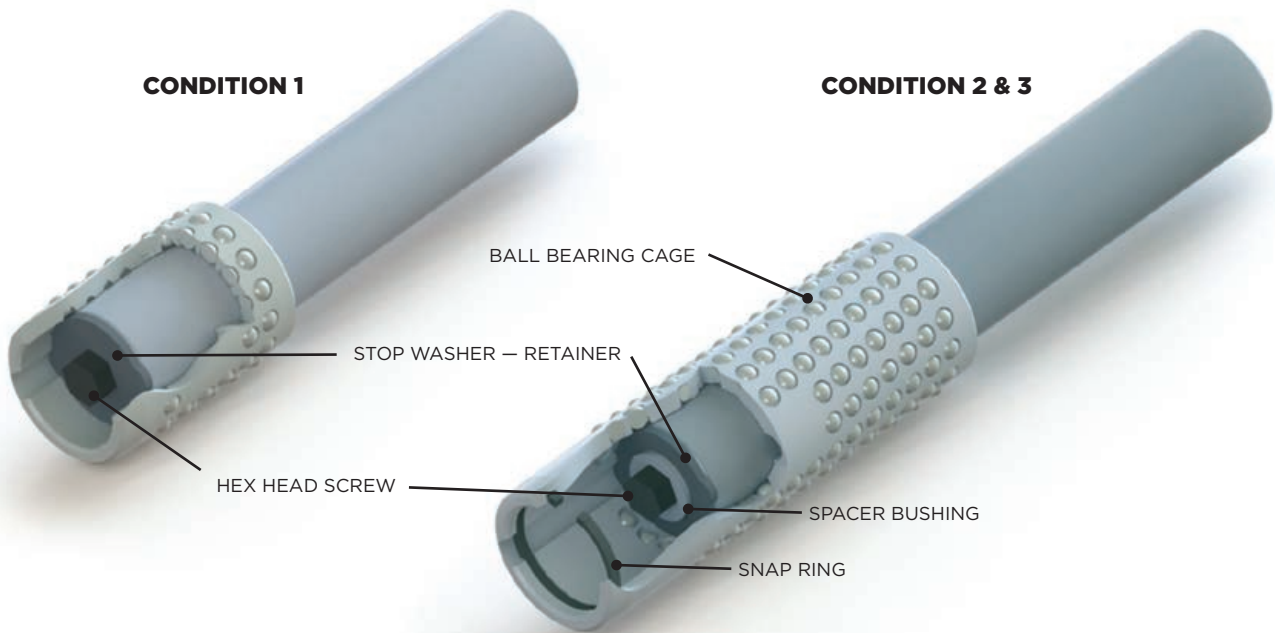
L	Dia. 1"	Dia. 1-1/4"	Dia. 1-1/2"	Dia. 1-3/4"	Dia. 2"	Dia. 2-1/2"	Dia. 3"
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
2-1/2	537-0810	—	—	—	—	—	—
3	537-0812	537-1012	537-1212	—	—	—	—
3-1/2	537-0814	537-1014	—	537-1414	—	—	—
3-3/4	—	—	537-1215	—	—	—	—
4	537-0816	537-1016	—	—	537-1616	—	—
4-1/4	—	—	—	537-1417	—	—	—
4-1/2	537-0818	537-1018	537-1218	—	—	—	—
4-3/4	—	—	—	—	537-1619	—	—
5	537-0820	537-1020	537-1220	537-1420	—	—	—
5-1/2	—	—	537-1222	537-1422	537-1622	—	—
6	—	537-1024	537-1224	537-1424	—	537-2024	—
6-1/4	—	—	—	—	537-1625	—	—
6-3/4	—	—	—	—	—	537-2027	537-2427
7	—	—	537-1228	537-1428	537-1628	—	—
7-1/2	—	—	—	—	—	537-2030	537-2430
8	—	—	537-1232	537-1432	537-1632	—	—
8-1/2	—	—	—	—	—	537-2034	537-2434
9	—	—	—	537-1436	537-1636	—	—
9-1/2	—	—	—	—	—	537-2038	537-2438
10	—	—	—	—	537-1640	—	—
10-1/2	—	—	—	—	—	537-2042	537-2442

TYPE D – BALL BEARING

BALL BEARING WASHER ASSEMBLY KIT

The **Condition 1** Washer Assembly parts include only the Stop Washer and Hex Screw. Either Condition 1 or 2 cages can be used with this assembly (i.e., 535-1210-1).

The **Condition 2 & 3** Washer Assembly parts include a Stop Washer, Spacer Bushing, Snap Ring, and Hex Screw. Only Condition 2 cages should be used with this assembly (i.e., 535-1211-2).



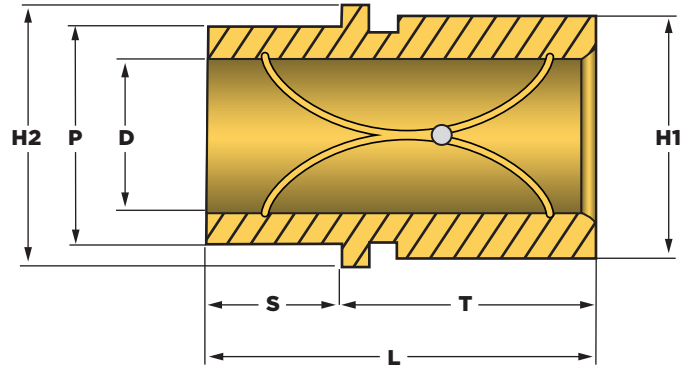
PINS AND CAGES SOLD SEPARATELY

Nominal Dia.	Washer Assembly		Stop Washer — Retainer		Bushing Stop Washer	Hex Head Screw	Snap Ring — Ball Bearing Cages
	Type 1	Type 2	Type 1	Type 2 & 3	Type 2 & 3	Type 1, 2 & 3	Type 2 & 3
1"	530-08KT-1	530-08KT-2	53W-0800-1	53W-0800-2	53B-0800	X0312C006	53R-0800
1-1/4"	530-10KT-1	530-10KT-2	53W-1000-1	53W-1000-2	53B-0800	X0312C006	53R-1000
1-1/2"	530-12KT-1	530-12KT-2	53W-1200-1	53W-1200-2	53B-1200	X0375C007	53R-1200
1-3/4"	530-14KT-1	530-14KT-2	53W-1400-1	53W-1400-2	53B-1200	X0375C007	53R-1400
2"	530-16KT-1	530-16KT-2	53W-1600-1	53W-1600-2	53B-1200	X0375C007	53R-1600
2-1/2"	530-20KT-1	530-20KT-2	53W-2000-1	53W-2000-2	53B-2400	X0500C010	53R-2000
3"	530-24KT-1	530-24KT-2	53W-2400-1	53W-2400-2	53B-2400	X0500C010	53R-2400

DEMOUNTABLE SHOULDER BUSHINGS



SHORT - MEDIUM - LONG



FOR T = SHORT - MEDIUM - LONG			
D (nominal)	P (nominal)	H1	H2
18mm	28	28	32
19mm			
24mm	38	44	47
25mm			
30mm	45	51	54
32mm			
38mm	54	60	63
40mm			
48mm	65	73	75
50mm			
63mm	81	90	93
80mm	100	110	115

PLAIN-BEARING (BRONZE)												
Dia.	T = SHORT				T = MEDIUM				T = LONG			
	T	S	L	Part No.	T	S	L	Part No.	T	S	L	Part No.
18mm	16	18	34	612-18016	32	18	50	612-18032	Upon Request			
19mm				612-19016				612-19032				
24mm	21	23	44	612-24021	47	23	70	612-24047	75	23	98	612-24075
25mm				612-25021				612-25047				612-25075
30mm	21	25	46	612-30021	50	25	75	612-30050	75	25	100	612-30075
32mm				612-32021				612-32050				612-32075
38mm	21	30	51	612-38021	50	30	80	612-38050	85	30	115	612-38085
40mm				612-40021				612-40050				612-40085
48mm	25	35	60	612-48025	50	35	85	612-48050	100	35	135	612-48100
50mm				612-50025				612-50050				612-50100
63mm	27	48	75	612-63027	52	48	100	612-63052	Upon Request			
80mm				612-80027				612-80052				

TYPE D – FRICTION

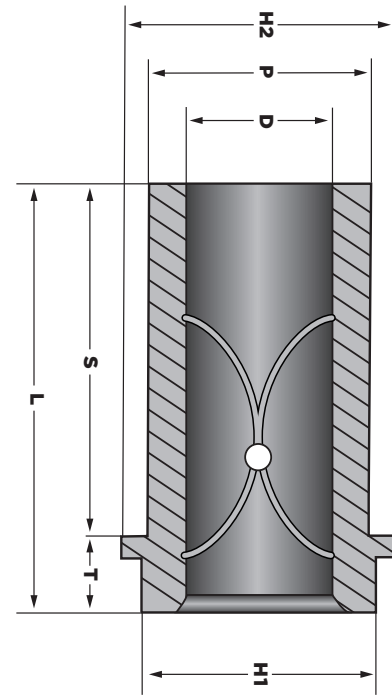
DEMOUNTABLE SHOULDER BUSHINGS

TYPE D – FRICTION

LOW PROFILE - PLAIN-BEARING

T = LOW PROFILE ONLY

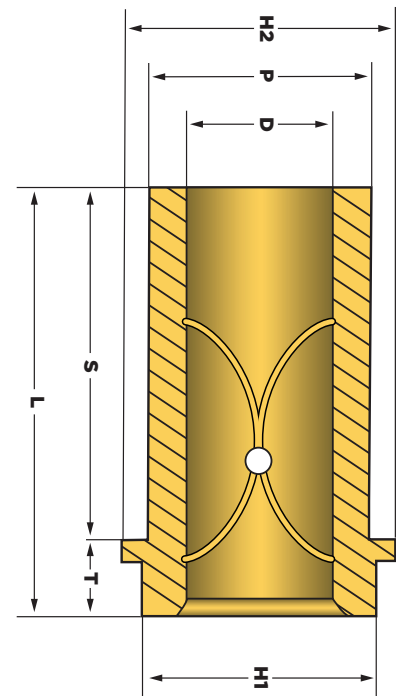
Dia. (nominal)	P (nominal)	H1	H2	T	S	L	Part No.
18mm	28	28	32	10	18	28	611-18010
19mm		611-19010					
24mm	38	36	47	10	23	33	611-24010
25mm		611-25010					
30mm	45	43	54	10	30	40	611-30010
32mm		611-32010					
38mm	54	48	63	14	38	52	611-38014
40mm		611-40014					
48mm	65	64	75	14	48	62	611-48014
50mm		611-50014					
63mm	81	79	93	14	61	75	611-63014
80mm	100	99	115		78	92	611-80014



LOW PROFILE - PLAIN-BEARING (BRONZE)

T = LOW PROFILE ONLY

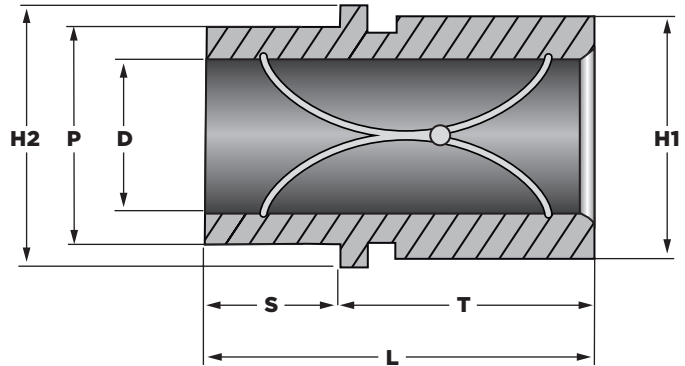
Dia. (nominal)	P (nominal)	H1	H2	T	S	L	Part No.
18mm	28	28	32	10	18	28	611-18010
19mm		611-19010					
24mm	38	36	47	10	23	33	611-24010
25mm		611-25010					
30mm	45	43	54	10	30	40	611-30010
32mm		611-32010					
38mm	54	48	63	14	38	52	611-38014
40mm		611-40014					
48mm	65	64	75	14	48	62	611-48014
50mm		611-50014					
63mm	81	79	93	14	61	75	611-63014
80mm	100	99	115		78	92	611-80014



DEMOUNTABLE SHOULDER BUSHINGS



SHORT - MEDIUM - LONG



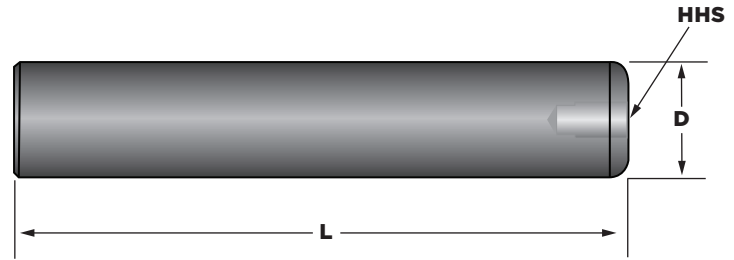
FOR T = LOW PROFILE ONLY			
D (nominal)	P (nominal)	H1	H2
18mm	28	28	32
19mm			
24mm	38	44	47
25mm			
30mm	45	51	54
32mm			
38mm	54	60	63
40mm			
48mm	65	73	75
50mm			
63mm	81	90	93
80mm			

PLAIN-BEARING												
Dia.	T = SHORT				T = MEDIUM				T = LONG			
	T	S	L	Part No.	T	S	L	Part No.	T	S	L	Part No.
18mm	16	18	34	611-18016	32	18	50	611-18032	Upon Request			
19mm				611-19016				611-19032				
24mm	21	23	44	611-24021	47	23	70	611-24047	75	23	98	611-24075
25mm				611-25021				611-25047				611-25075
30mm	21	25	46	611-30021	50	25	75	611-30050	75	25	100	611-30075
32mm				611-32021				611-32050				611-32075
38mm	21	30	51	611-38021	50	30	80	611-38050	85	30	115	611-38085
40mm				611-40021				611-40050				611-40085
48mm	25	35	60	611-48025	50	35	85	611-48050	100	35	135	611-48100
50mm				611-50025				611-50050				611-50100
63mm	27	48	75	611-63027	52	48	100	611-63052	Upon Request			
80mm				611-80027				611-80052				

TYPE D – FRICTION

PRESS FIT STRAIGHT PINS

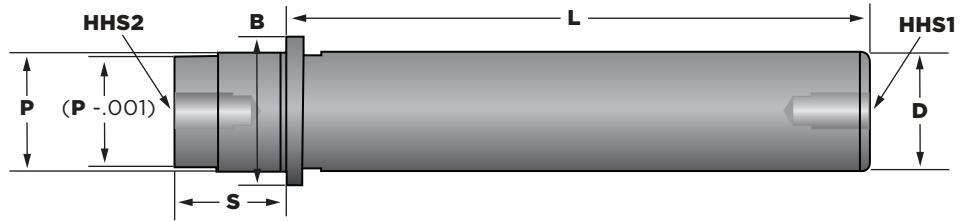
D (nominal)	HHS	D (nominal)	HHS
18	—	38	—
19	—	40	M10x1.5
24	—	48	—
25	M6x1.0	50	M10x1.5
30	—	63	M10x1.5
32	M6x1.0	80	M10x1.5



TYPE D — FRICTION

PLAIN-BEARING L = 100-500												
L	D = 18mm	D = 19mm	D = 24mm	D = 25mm	D = 30mm	D = 32mm	D = 38mm	D = 40mm	D = 48mm	D = 50mm	D = 63mm	D = 80mm
100	621-18100	621-19100	621-24100	621-25100	621-30100	621-32100	—	—	—	—	—	—
110	621-18110	621-19110	621-24110	621-25110	621-30110	621-32110	621-38110	621-40110	—	—	—	—
120	621-18120	621-19120	621-24120	621-25120	621-30120	621-32120	621-38120	621-40120	—	—	—	—
130	621-18130	621-19130	621-24130	621-25130	621-30130	621-32130	621-38130	621-40130	621-48130	621-50130	—	—
140	621-18140	621-19140	621-24140	621-25140	621-30140	621-32140	621-38140	621-40140	621-48140	621-50140	—	—
150	621-18150	621-19150	621-24150	621-25150	621-30150	621-32150	621-38150	621-40150	621-48150	621-50150	—	—
160	621-18160	621-19160	621-24160	621-25160	621-30160	621-32160	621-38160	621-40160	621-48160	621-50160	—	—
170	621-18170	621-19170	621-24170	621-25170	621-30170	621-32170	621-38170	621-40170	621-48170	621-50170	—	—
180	621-18180	621-19180	621-24180	621-25180	621-30180	621-32180	621-38180	621-40180	621-48180	621-50180	—	—
190	621-18190	621-19190	621-24190	621-25190	621-30190	621-32190	621-38190	621-40190	621-48190	621-50190	—	—
200	621-18200	621-19200	621-24200	621-25200	621-30200	621-32200	621-38200	621-40200	621-48200	621-50200	621-63200	621-80200
220	—	—	621-24220	621-25220	621-30220	621-32220	621-38220	621-40220	621-48220	621-50220	621-63220	621-80220
240	—	—	621-24240	621-25240	621-30240	621-32240	621-38240	621-40240	621-48240	621-50240	621-63240	621-80240
260	—	—	621-24260	621-25260	621-30260	621-32260	621-38260	621-40260	621-48260	621-50260	621-63260	621-80260
280	—	—	—	—	621-30280	621-32280	621-38280	621-40280	621-48280	621-50280	621-63280	621-80280
300	—	—	—	—	621-30300	621-32300	621-38300	621-40300	621-48300	621-50300	621-63300	621-80300
320	—	—	—	—	621-30320	621-32320	621-38320	621-40320	621-48320	621-50320	621-63320	621-80320
360	—	—	—	—	—	—	621-38360	621-40360	621-48360	621-50360	621-63360	621-80360
400	—	—	—	—	—	—	—	—	621-48400	621-50400	621-63400	621-80400
450	—	—	—	—	—	—	—	—	621-48450	621-50450	621-63450	621-80450
500	—	—	—	—	—	—	—	—	—	—	621-63500	621-80500

DEMOUNTABLE PINS



Hardened to 60 ± 2 Rc

D (nominal)	P (nominal)	B	S	HHS1	HHS2
18	18	25.6	20	—	M5 x 0.8
19	19			—	
24	24	32.6	24	—	M6 x 1.0
25	25			M6 x 1.0	
30	30	40.6	30	—	M6 x 1.0
32	32			M6 x 1.0	

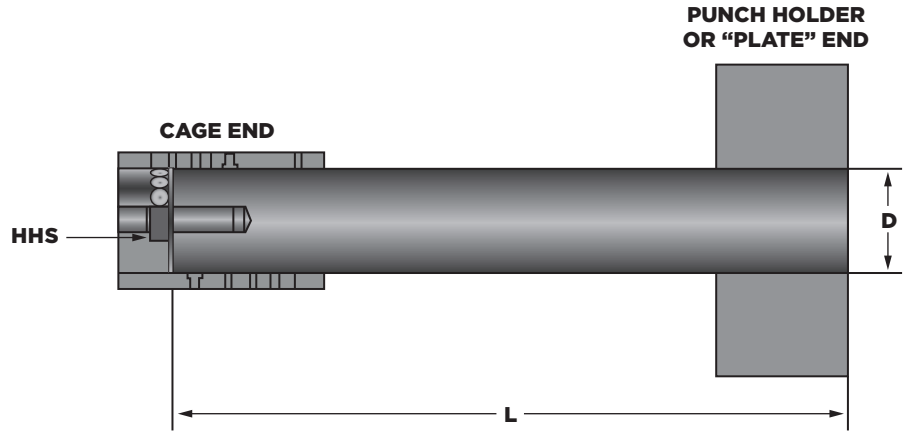
D (nominal)	P (nominal)	B	S	HHS1	HHS2
38	38	50.8	37	—	M10 x 1.5
40	40			M10 x 1.5	
48	48	63.8	45	—	M12 x 1.75
50	50			M10 x 1.5	
63	63	76.0	49	—	M16 x 2.0
80	80			M10 x 1.5	

PLAIN-BEARING

L	D = 18mm	D = 19mm	D = 24mm	D = 25mm	D = 30mm	D = 32mm	D = 38mm	D = 40mm	D = 48mm	D = 50mm	D = 63mm	D = 80mm
80	622-18080	622-19080	622-24080	622-25080	—	—	—	—	—	—	—	—
90	622-18090	622-19090	622-24090	622-25090	—	—	—	—	—	—	—	—
100	622-18100	622-19100	622-24100	622-25100	622-30100	622-32100	—	—	—	—	—	—
110	622-18110	622-19110	622-24110	622-25110	622-30110	622-32110	622-38110	622-40110	622-48110	622-50110	—	—
120	622-18120	622-19120	622-24120	622-25120	622-30120	622-32120	622-38120	622-40120	622-48120	622-50120	622-63120	622-80120
130	—	—	622-24130	622-25130	622-30130	622-32130	622-38130	622-40130	622-48130	622-50130	—	—
140	622-18140	622-19140	622-24140	622-25140	622-30140	622-32140	622-38140	622-40140	622-48140	622-50140	622-63140	622-80140
150	—	—	622-24150	622-25150	622-30150	622-32150	622-38150	622-40150	622-48150	622-50150	—	—
160	622-18160	622-19160	622-24160	622-25160	622-30160	622-32160	622-38160	622-40160	622-48160	622-50160	622-63160	622-80160
170	—	—	622-24170	622-25170	622-30170	622-32170	622-38170	622-40170	622-48170	622-50170	—	—
180	—	—	622-24180	622-25180	622-30180	622-32180	622-38180	622-40180	622-48180	622-50180	622-63180	622-80180
190	—	—	622-24190	622-25190	622-30190	622-32190	622-38190	622-40190	622-48190	622-50190	—	—
200	—	—	622-24200	622-25200	622-30200	622-32200	622-38200	622-40200	622-48200	622-50200	622-63200	622-80200
220	—	—	—	—	622-30220	622-32220	622-38220	622-40220	622-48220	622-50220	622-63220	622-80220
240	—	—	—	—	622-30240	622-32240	622-38240	622-40240	622-48240	622-50240	622-63240	622-80240
280	—	—	—	—	622-30280	622-32280	622-38280	622-40280	622-48280	622-50280	622-63280	622-80280
320	—	—	—	—	—	—	—	—	622-48320	622-50320	622-63320	622-80320
360	—	—	—	—	—	—	—	—	622-48360	622-50360	622-63360	622-80360
400	—	—	—	—	—	—	—	—	622-48400	622-50400	622-63400	622-80400

TYPE D – FRICTION

BALL BEARING PRESS FIT STRAIGHT PINS



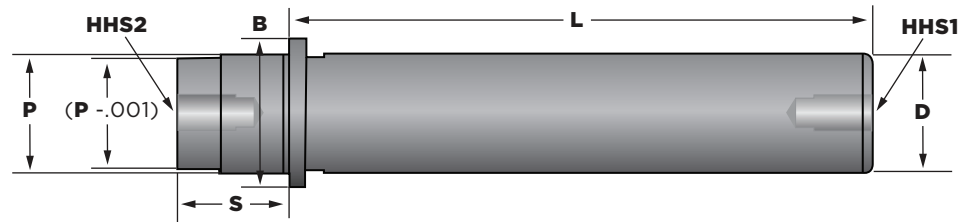
D (nominal)	HHS
25	M6 x 1.0
32	
40	M10 x 1.5
50	
63	
80	

Hardened to 60 ± 2 Rc

TYPE D – BALL BEARING

L	Dia. = 25mm	Dia. = 32mm	Dia. = 40mm	Dia. = 50mm	Dia. = 63mm	Dia. = 80mm
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
100	631-25100	631-32100	—	—	—	—
110	631-25110	631-32110	631-40110	—	—	—
120	631-25120	631-32120	631-40120	—	—	—
130	631-25130	631-32130	631-40130	631-50130	—	—
140	631-25140	631-32140	631-40140	631-50140	—	—
150	631-25150	631-32150	631-40150	631-50150	—	—
160	631-25160	631-32160	631-40160	631-50160	—	—
170	631-25170	631-32170	631-40170	631-50170	—	—
180	631-25180	631-32180	631-40180	631-50180	—	—
190	631-25190	631-32190	631-40190	631-50190	—	—
200	631-25200	631-32200	631-40200	631-50200	631-63200	631-80200
220	631-25220	631-32220	631-40220	631-50220	631-63220	631-80220
240	631-25240	631-32240	631-40240	631-50240	631-63240	631-80240
260	631-25260	631-32260	631-40260	631-50260	631-63260	631-80260
280	—	631-32280	631-40280	631-50280	631-63280	631-80280
300	—	631-32300	631-40300	631-50300	631-63300	631-80300
320	—	631-32320	631-40320	631-50320	631-63320	631-80320
360	—	—	631-40360	631-50360	631-63360	631-80360
400	—	—	—	631-50400	631-63400	631-80400
450	—	—	—	631-50450	631-63450	631-80450
500	—	—	—	—	631-63500	631-80500

BALL BEARING DEMOUNTABLE PINS



D (nominal)	P (nominal)	B	S	HHS1	HHS2
25	25	33	24	M6 x 1.0	M6 x 1.0
32	32	41	30		
40	40	51	37	M10 x 1.5	M10 x 1.5
50	50	64	45		M12 x 1.75
63	63	76	49	M10 x 1.5	M16 x 2.0
80	80	93	60		

Hardened to 60 ± 2 Rc

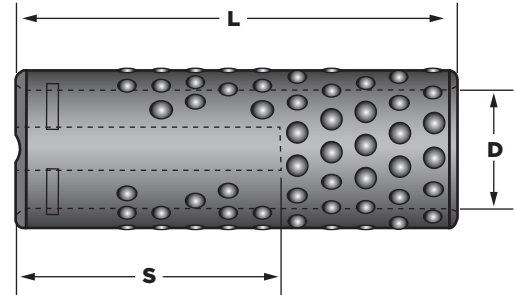
L	Dia. = 25mm	Dia. = 32mm	Dia. = 40mm	Dia. = 50mm	Dia. = 63mm	Dia. = 80mm
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
80	632-25080	—	—	—	—	—
90	632-25090	—	—	—	—	—
100	632-25100	632-32100	—	—	—	—
110	632-25110	632-32110	632-40110	632-50110	—	—
120	632-25120	632-32120	632-40120	632-50120	632-63120	632-80120
130	632-25130	632-32130	632-40130	632-50130	—	—
140	632-25140	632-32140	632-40140	632-50140	632-63140	632-80140
150	632-25150	632-32150	632-40150	632-50150	—	—
160	632-25160	632-32160	632-40160	632-50160	632-63160	632-80160
170	632-25170	632-32170	632-40170	632-50170	—	—
180	632-25180	632-32180	632-40180	632-50180	632-63180	632-80180
190	632-25190	632-32190	632-40190	632-50190	—	—
200	632-25200	632-32200	632-40200	632-50200	632-63200	632-80200
220	—	632-32220	632-40220	632-50220	632-63220	632-80220
240	—	632-32240	632-40240	632-50240	632-63240	632-80240
280	—	632-32280	632-40280	632-50280	632-63280	632-80280
320	—	—	—	632-50320	632-63320	632-80320
360	—	—	—	632-50360	632-63360	632-80360
400	—	—	—	632-50400	632-63400	632-80400

TYPE D – BALL BEARING

BALL BEARING CAGES

NOTE:

1. Ball diameter: 4mm, Pin diameter: 25mm ≤ 40mm
2. Ball diameter: 6mm, Pin diameter: ≤ 50mm

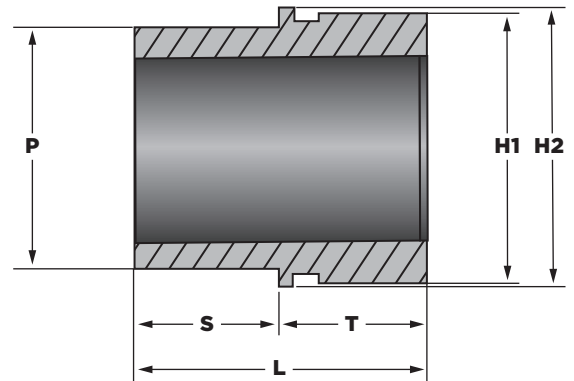

TYPE D – BALL BEARING
BALL BEARING CAGES — DIAMETER 25–40mm

Pin Dia.	L	S	Ball Dia.	Part No.
25mm	36	11.5	4	635-25036-1
	48	17.5		635-25048-1
	55	31		635-25055-2
	70	40		635-25070-2
	90	47		635-25090-2
	100	55		635-25100-2
	110	65		635-25110-2
32mm	36	11.5	4	635-32036-1
	48	17.5		635-32048-1
	70	40		635-32070-2
	90	47		635-32090-2
	105	55		635-32105-2
	115	65		635-32115-2
	125	75		635-32125-2
40mm	135	85	4	635-32135-2
	48	17.5		635-40048-1
	60	23.5		635-40060-1
	70	40		635-40070-2
	85	48		635-40085-2
	105	56		635-40105-2
	115	66		635-40115-2
	125	76		635-40125-2
	135	86		635-40135-2
	145	96		635-40145-2
	155	107		635-40155-2

BALL BEARING CAGES — DIAMETER 58–80mm

Pin Dia.	L	S	Ball Dia.	Part No.
50mm	70	28	6	635-50070-1
	84	35		635-50084-1
	105	56		635-50105-2
	120	65		635-50120-2
	140	76		635-50140-2
	150	86		635-50150-2
	160	96		635-50160-2
63mm	170	108	6	635-50170-2
	185	121		635-50185-2
	195	133		635-50195-2
	98	42		635-63098-1
	145	76		635-63145-2
	165	86		635-63165-2
	180	96		635-63180-2
80mm	190	107	6	635-63190-2
	205	121		635-63205-2
	215	132		635-63215-2
	98	42		635-80098-1
	145	76		635-80145-2
	165	86		635-80165-2
	180	96		635-80180-2
	190	107		635-80190-2
	205	121		635-80205-2
	215	132		635-80215-2

BALL BEARING DEMOUNTABLE BUSHINGS



Hardened to $60 \pm 2 Rc$

Dia.	P (nominal)	S	H1	H2	T = 35mm		T = 50mm		T = 60mm	
					L	Part No.	L	Part No.	L	Part No.
25mm	45	30	50.8	55.1	65	636-25035	80	636-25050	—	—
32mm	54		55.9	64.0	—	—		636-32050	—	—
40mm	65		73.2	77.0	—	—		636-40050	—	—
50mm	81	50	88.6	95.0	—	—	—	—	110	636-50060
63mm	95		103.9	109.0	—	—	—	—	—	
80mm	108		61	114.3	125.0	—	—	—	—	—

Dia.	P (nominal)	S	H1	H2	T = 65mm		T = 80mm		T = 100mm	
					L	Part No.	L	Part No.	L	Part No.
25mm	45	30	50.8	55.1	95	636-25065	—	—	—	—
32mm	54		55.9	64.0		636-32065	110	636-32080	—	—
40mm	65		73.2	77.0		636-40065		636-40080	130	636-40100
50mm	81	50	88.6	95.0	—	—	130	636-50080	150	636-50100
63mm	95		103.9	109.0	—	—	—	—		636-63100
80mm	108		61	114.3	125.0	—	—	—	—	161

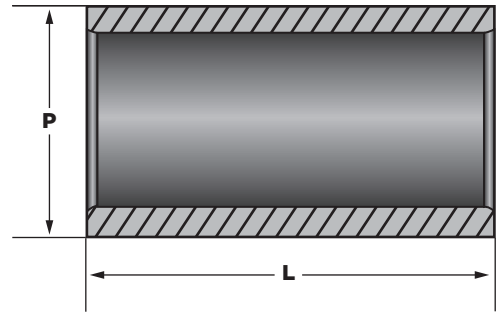
Dia.	P (nominal)	S	H1	H2	T = 117mm		T = 120mm		T = 140mm	
					L	Part No.	L	Part No.	L	Part No.
25mm	45	30	50.8	55.1	—	—	—	—	—	—
32mm	54		55.9	64.0	—	—	—	—	—	—
40mm	65		73.2	77.0	—	—	—	—	—	—
50mm	81	50	88.6	95.0	—	—	170	636-50120	—	—
63mm	95		103.9	109.0	—	—		636-63120	190	636-63140
80mm	108		61	114.3	125.0	178	636-80117	—	—	201

TYPE D – BALL BEARING

BALL BEARING SLEEVE BUSHINGS

Dia.	P (nominal)
25mm	45
32mm	54
40mm	65
50mm	81
63mm	95
80mm	112

Hardened to 60 ± 2 Rc

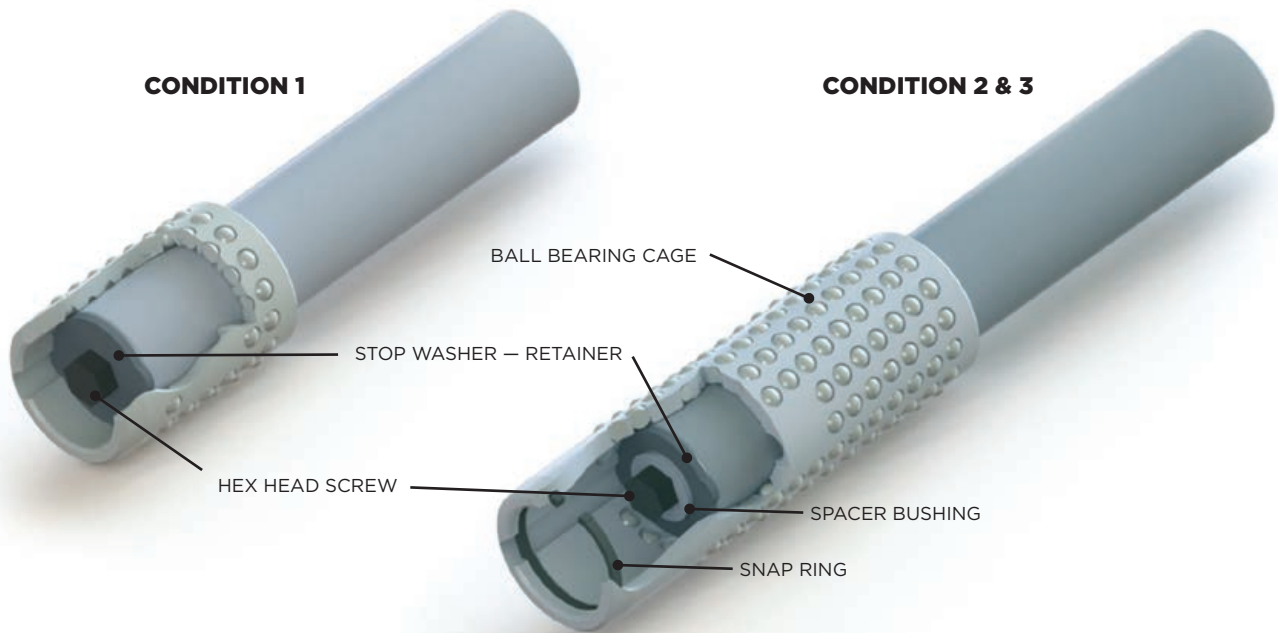


L	Dia. = 25mm	Dia. = 32mm	Dia. = 40mm	Dia. = 50mm	Dia. = 63mm	Dia. = 80mm
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
65	637-25065	—	—	—	—	—
80	637-25080	637-32080	637-40080	—	—	—
95	637-25095	637-32095	637-40095	—	—	—
110	637-25110	637-32110	637-40110	637-50110	—	—
130	637-25130	637-32130	637-40130	637-50130	—	—
150	—	637-32150	637-40150	637-50150	637-63150	637-80150
170	—	637-32170	637-40170	637-50170	637-63170	637-80170
190	—	—	637-40190	637-50190	637-63190	637-80190
215	—	—	637-40215	637-50215	637-63215	637-80215
240	—	—	—	637-50240	637-63240	637-80240
265	—	—	—	637-50265	637-63265	637-80265

BALL BEARING WASHER ASSEMBLY KIT

The **Condition 1** Washer Assembly parts include only the Stop Washer and Hex Screw. Either Condition 1 or 2 cages can be used with this assembly (i.e., 535-1210-1).

The **Condition 2 & 3** Washer Assembly parts include a Stop Washer, Spacer Bushing, Snap Ring, and Hex Screw. Only Condition 2 cages should be used with this assembly (i.e., 535-1211-2).



PINS AND CAGES SOLD SEPARATELY

Nominal Dia.	Washer Assembly Part No.		Stop Washer — Retainer		Bushing Stop Washer	Hex Head Screw	Snap Ring — Ball Bearing Cages
	Type 1	Type 2	Type 1	Type 2 & 3	Type 2 & 3	Type 1, 2 & 3	Type 2 & 3
25mm	630-25KT-1	630-25KT-2	63W-25000-1	63W-25000-2	63B-25000	SM6C020	63R-25000
32mm	630-32KT-1	630-32KT-2	63W-32000-1	63W-32000-2	63B-25000	SM6C020	63R-32000
40mm	630-40KT-1	630-40KT-2	63W-40000-1	63W-40000-2	63B-40000	SM10C025	63R-40000
50mm	630-50KT-1	630-50KT-2	63W-50000-1	63W-50000-2	63B-40000	SM10C025	63R-50000
63mm	630-63KT-1	630-63KT-2	63W-63000-1	63W-63000-2	63B-40000	SM10C025	63R-63000
80mm	630-80KT-1	630-80KT-2	63W-80000-1	63W-80000-2	63B-40000	SM10C025	63R-80000

TYPE D — BALL BEARING

PIN CLAMP ORIENTATIONS

CLAMPS

Clamps are available in three styles. See chart for specific die set component application. All slip fit demountable guide pins or bushings are supplied with clamps and screws.

CLAMP LOCATION SYSTEMS

Three pin and bushing clamp location systems are available for die sets. The LR, FB and R systems allow for various material feeding directions and should be considered when ordering any die set. Special pin and bushing clamp configurations are available as an option.

TYPE D – PIN & BUSHING

FRICTION AND BALL BEARING PINS		
SYSTEM R	SYSTEM FB	SYSTEM LR
Inch 1", 1-1/4", 1-1/2" Nominal Diameter Metric 18, 19, 24, 25, 30, 32mm Nominal Diameter		
Inch 1-3/4 Nominal Diameter		

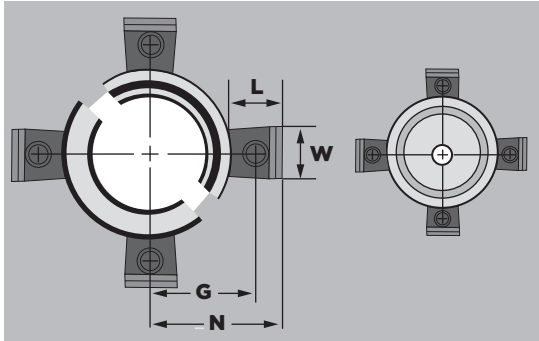
FRICTION AND BALL BEARING PINS		
SYSTEM R	SYSTEM FB	SYSTEM LR
Inch 2" Nominal Diameter		
Inch 2-1/2", 3" Nominal Diameter Metric 38, 40, 48, 50, 63, 80mm Nominal Diameter		

BUSHING CLAMP ORIENTATIONS

FRICTION BUSHING			BALL BEARING BUSHING		
SYSTEM R	SYSTEM FB	SYSTEM LR	SYSTEM R	SYSTEM FB	SYSTEM LR
Inch 3/4"-1" Nom. Dia. Metric 18, 29, 24, 25mm Nom. Dia. Metric 18, 19mm Nominal Dia.		Short-Med-Long Short-Med-Long Low Profile	Metric 18, 29, 24, 25mm Nom. Dia. Metric 18, 19mm Nom. Dia.		
Inch 1-1/4"-1-1/2" Nom. Dia. Inch 1"-1-1/2" Steel/Bronze/Bronze-Rite® Metric 30, 32, 38, 40mm Nom. Dia. Metric 24, 25, 30, 32mm Nom. Dia.		Short-Med-Long Low Profile Short-Med-Long Low Profile	Inch 1" and 1-1/4" Nom. Dia. Metric 30, 32, 38, 44mm Nom. Dia. Metric 24, 25, 30, 32mm Nom. Dia.		
Inch 1-3/4"-2" Nom. Dia. Inch 1-3/4"-2" Nom. Dia.		Short-Med-Long Steel/Bronze/Bronze-Rite® Low Profile	Inch 1-1/2"-2" Nom. Dia.		
Inch 2-1/2" Nom. Dia. Inch 2-1/2" Nom. Dia.		Short-Med-Long Steel/Bronze/Bronze-Rite® Low Profile	Inch 2-1/2" Nom. Dia.		
Inch 3"-4" Nom. Dia. Metric 48, 50, 63, 80mm Nom. Dia. Metric 38, 40, 48, 50, 63, 80mm Nom. Dia.		Short-Med-Long Short-Med-Long Low Profile	Inch 3" Nom. Dia. Metric 48, 50, 63, 88mm Nom. Dia. Metric 38, 40, 48, 50, 63, 80mm Nom. Dia.		

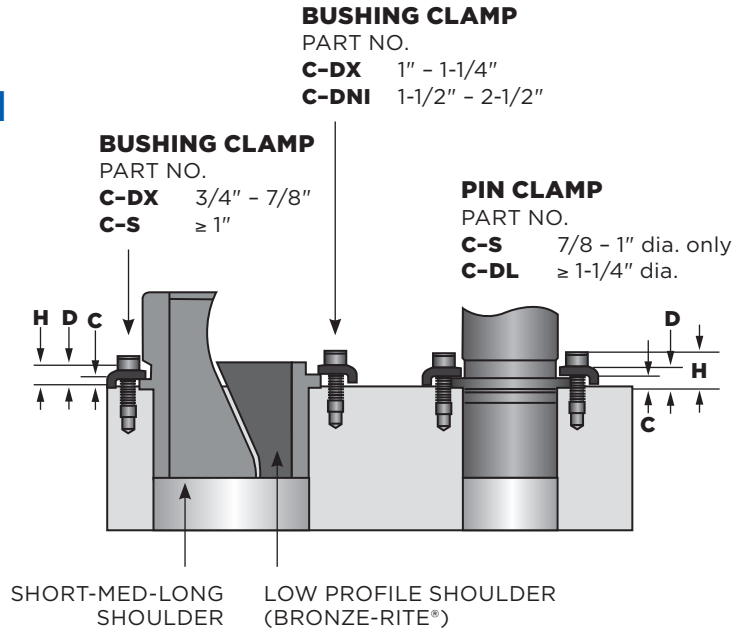
TYPE D – PIN & BUSHING

CLAMP TYPE — FRICTION

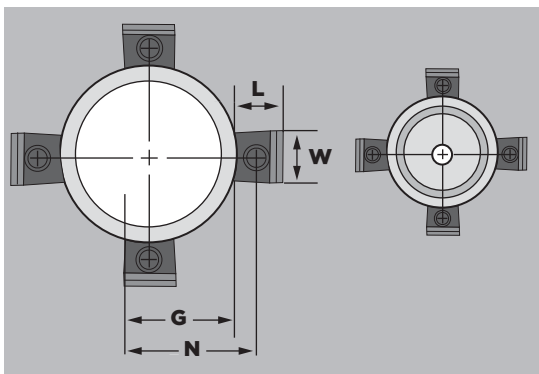


TYPE D BUSHING

TYPE D PIN

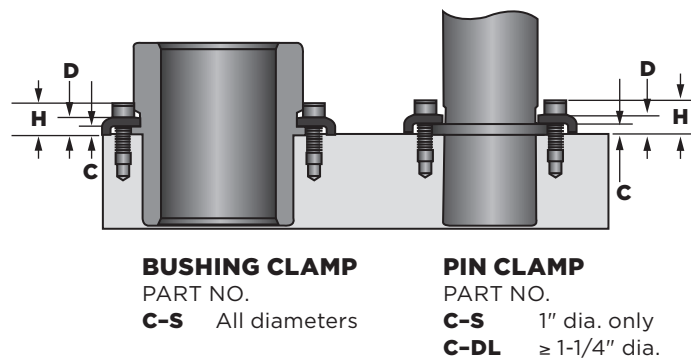


CLAMP TYPE — BALL BEARING



TYPE D BUSHING

TYPE D PIN

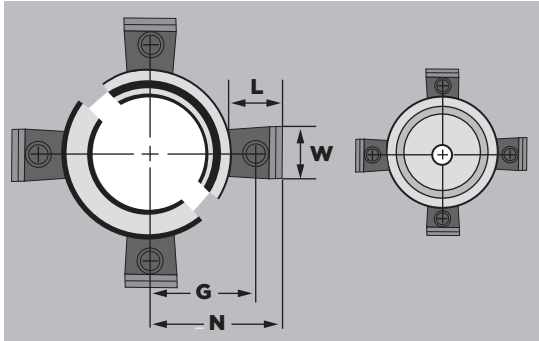


PIN & BUSHING CLAMP LOCATIONS AND BORE SIZES

COMPONENT	Nom. Dia.	Location		Size					Clamp No.	Qty.	Screw Size	Boring Size for Pin or Bushing									
	Bush I.D. PIN O.D.	G	N	L	W	C	D	H				Min.	Max.								
BUSHINGS Demountable SHORT-MED-LONG Shoulder All Material	3/4"	0.791	1.025	0.469	0.500	0.125	0.219	0.469	C-DX	2	1/4"-20 x 5/8"	1.1250	1.1255								
	7/8"	0.916	1.150									1.3750	1.3755								
	1"	1.175	1.560	0.745	0.688	0.188	0.370	0.688	C-S	4	5/16"-18 x 3/4"	1.5000	1.5005								
	1-1/4"	1.300	1.685									1.7500	1.7505								
	1-1/2"	1.425	1.810									2.0000	2.0005								
	1-3/4"	1.580	1.965									2.2500	2.5005								
	2"	1.780	2.165									2.5000	2.5005								
	2-1/2"	2.135	2.520									3.2500	3.2505								
3"	2.370	2.755	3.7500									3.7505									
BUSHINGS Demountable Low Profile Shoulder Self Lubricating	1"	1.157	1.542									0.745	0.688	0.188	0.370	0.688	C-S	3	5/16"-18 x 3/4"	1.5000	1.5005
	1-1/4"	1.347	1.732	1.7500	1.7505																
	1-1/2"	1.467	1.852	2.0000	2.0005																
	1-3/4"	1.597	1.982	2.2500	2.5005																
	2"	1.772	2.157	2.5000	2.5005																
	2-1/2"	1.987	2.372	3.0000	3.2505																
	3"	2.237	2.622	3.5000	3.7505																
	3-3/4"	2.737	3.122	4.5000	4.5005																
BUSHINGS Demountable Low Profile Shoulder Bronze Rite®	1"	1.063	1.297	0.469	0.500	0.125	0.219	0.469	C-DX	3	1/4"-20 x 5/8"	1.5000	1.5005								
	1-1/4"	1.188	1.422									1.7500	1.7505								
	1-1/2"	1.438	1.750	0.719	0.719	0.193	0.453	0.453	C-DNI	4	5/16"-18 x 3/4"	2.0000	2.0005								
	1-3/4"	1.594	1.906									2.2500	2.5005								
	2"	1.781	2.094									2.5000	2.5005								
2-1/2"	2.141	2.453	3.2500	3.2505																	
BUSHINGS: Demountable Ball Bearing	1"	1.313	1.698	0.745	0.688	0.188	0.370	0.688	C-S	4	5/16"-18 x 3/4"	1.8750	1.8755								
	1-1/4"	1.438	1.823									2.1250	2.1255								
	1-1/2"	1.688	2.073									2.5000	2.5005								
	1-3/4"	1.813	2.198									2.7500	2.7505								
	2"	2.063	2.448									3.2500	3.2505								
	2-1/2"	2.313	2.698									3.7500	3.7505								
	3"	2.625	3.010									4.2500	4.2505								
GUIDE PINS Demountable Friction	7/8"	0.844	1.229	0.745	0.688	0.188	0.370	0.688	C-S	3	5/16"-18 x 3/4"	0.8752	0.8760								
	1"	0.906	1.291									1.0002	1.0010								
	1-1/4"	0.985	1.391									0.822	0.625	0.250	0.443	0.752	C-DL	4	5/16"-18 x 3/4"	1.2502	1.2510
	1-1/2"	1.125	1.531																	1.5002	1.5010
	1-3/4"	1.297	1.703																	1.7502	1.7510
	2"	1.422	1.828																	2.0002	2.0010
	2-1/2"	1.672	2.078																	2.5002	2.5010
3"	1.922	2.328	3.0002	3.0010																	
GUIDE PINS Demountable Ball Bearing	1"	0.906	1.291	0.745	0.688	0.188	0.370	0.688	C-S	3	5/16"-18 x 3/4"	0.9980	0.9988								
	1-1/4"	0.985	1.391									0.822	0.625	0.250	0.443	0.752	C-DL	4	5/16"-18 x 3/4"	1.2480	1.2488
	1-1/2"	1.125	1.531																	1.4975	1.4983
	1-3/4"	1.297	1.703																	1.7475	1.7483
	2"	1.422	1.828																	1.9975	1.9983
	2-1/2"	1.672	2.078																	2.4970	2.4978
3"	1.922	2.328	2.9970	2.9978																	

TYPE D – PIN & BUSHING

CLAMP TYPE — FRICTION

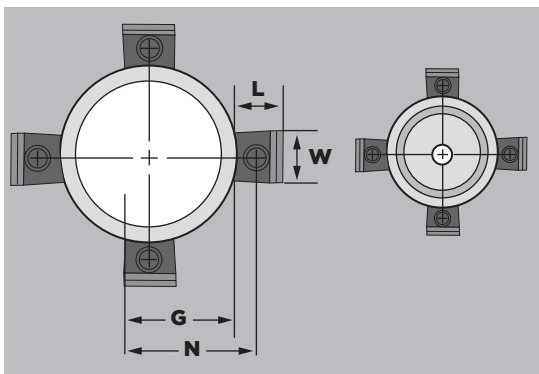

TYPE D BUSHING
TYPE D PIN

BUSHING CLAMP PART NO. C-DX 18/19mm C-DNM-96 24-32mm C-DNM-97 38-80mm		PIN CLAMP PART NO. C-DX 18/19mm dia. only C-S 24/25mm dia. only C-DL ≥ 30mm dia.	
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BUSHING CLAMP PART NO. C-DX 18/19mm C-S ≥ 24mm		PIN CLAMP PART NO. C-DX 18/19mm dia. only C-S 24/25mm dia. only C-DL ≥ 30mm dia.	
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SHORT-MED-LONG SHOULDER **LOW PROFILE SHOULDER (BRONZE-RITE®)**

CLAMP TYPE — BALL BEARING


TYPE D BUSHING
TYPE D PIN

BUSHING CLAMP PART NO. C-S All diameters		PIN CLAMP PART NO. C-DX 18/19mm dia. only C-S 24/25mm dia. only C-DL ≥ 30mm dia.	
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PIN & BUSHING CLAMP LOCATIONS AND BORE SIZES

COMPONENT	Nom. Dia.	Location		Size					Clamp No.	Qty.	Screw Size	Boring Size for Pin or Bushing*	
	Bush I.D. PIN O.D.	G	N	L	W	C	D	H				Min.	Max.
BUSHINGS: Demountable SHORT-MED-LONG Shoulder Friction	18/19mm	19.55	25.5	12.3	12.7	3.2	5.6	11.6	C-DX	2	M6 x 1.0 x 20mm	28.008	28.013
	24/25mm	30.51	40.3	18.92	17.46	4.76	9.38	17.32	C-S	2	M8 x 1.25 x 20mm	38.008	38.016
	30/32mm	34.01	43.8							3		45.008	45.016
	38/40mm	38.51	48.3							4		54.010	54.019
	48/50mm	44.51	54.3							4		65.011	65.019
	63mm	53.51	63.3							4		81.013	81.022
	80mm	64.51	74.3							4		100.013	100.022
BUSHINGS: Demountable Low Profile Shoulder Self Friction	18/19mm	19.55	25.5							12.3		12.7	3.2
	24/25mm	30.84	37.94	17.5	14.5	5.0	10.0	10.0	C-DNM-96	3	M6 x 1.0 x 20mm	38.008	38.016
	30/32mm	34.34	41.44									45.008	45.016
	38/40mm	41.0	52.1									54.010	54.019
	48/50mm	47.0	58.1	24.6	18.9	7.9	13.0	13.0	C-DNM-97	4	M8 x 1.25 x 20mm	65.011	65.019
	63mm	56.0	67.1									81.013	81.022
	80mm	67.0	78.1									100.013	100.022
BUSHINGS: Demountable Ball Bearing	25mm	34.91	44.7									18.92	17.46
	32mm	38.41	48.2	54.000	54.019								
	40mm	45.91	55.7	65.001	65.019								
	50mm	53.91	63.7	81.000	81.022								
	63mm	61.91	71.7	95.001	95.022								
	80mm	67.91	77.7	108.000	108.022								
	GUIDE PINS: Demountable	18mm	16.05	22.0	12.3	12.7	3.2	5.6	11.6	C-DX	3		
19mm		18.956										18.969	
24mm		23.01	32.8	18.92	17.46	4.76	9.38	17.32	C-S	3	M8 x 1.25 x 20mm	23.957	23.969
25mm												24.956	24.969
30mm		25.9	36.2	19.6	15.9	6.3	10.9	18.9	C-DL	3	M8 x 1.25 x 20mm	29.957	29.969
32mm												31.946	31.962
38mm		30.9	41.2	19.6	15.9	6.3	10.9	18.9	C-DL	4	M8 x 1.25 x 20mm	37.950	37.962
40mm												39.947	39.962
48mm		37.4	47.7	19.6	15.9	6.3	10.9	18.9	C-DL	4	M8 x 1.25 x 20mm	47.950	47.962
50mm												49.947	49.962
63mm		43.4	53.7	19.6	15.9	6.3	10.9	18.9	C-DL	4	M8 x 1.25 x 20mm	62.934	62.953
80mm		51.9	62.2	19.6	15.9	6.3	10.9	18.9	C-DL	4	M8 x 1.25 x 20mm	79.929	79.947

TYPE D – PIN & BUSHING

*This system uses ISO fits – these bore sizes are a guideline. Please verify your desired fit, component diameter, and reference ISO standards for the proper tolerancing.

ACCESSORIES

PRY BARS

Superior offers two sizes of pry bars — 20" and 42". Both have a gooseneck and chisel point design and have Aluminum Bronze applied to the heel and tip. The 20" model incorporates a waxed finish protective coating for sure handling.

Application	Part No.
Ball Bearing	PBR-20
	PBR-42



ACCESSORIES

LUBRIPLATE LUBRICANTS

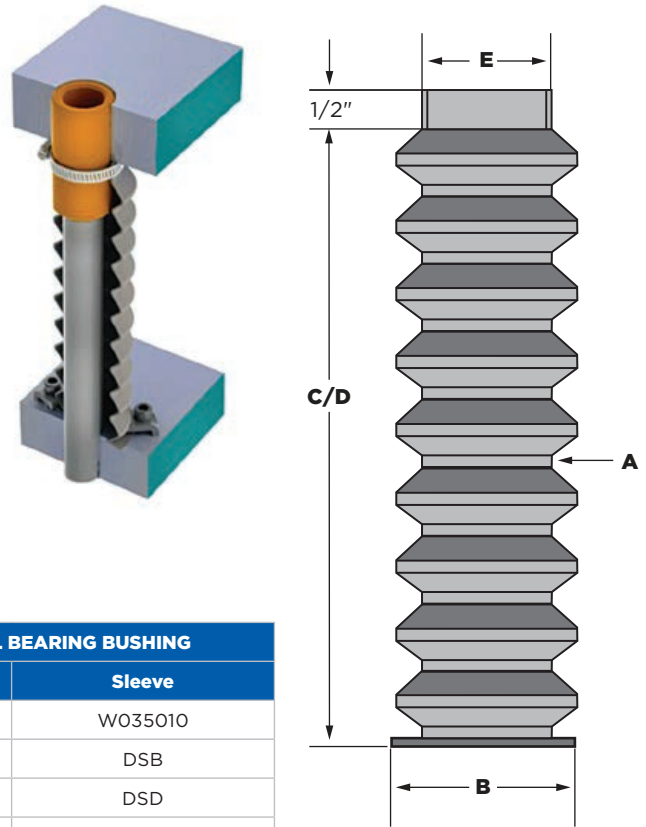
Application	Lubriplate Product	Container Size	Quantity
Ball Bearing	LMag-00-2	2 lb. Plastic Bottles	12
	LMag-00-7	7 lb. Jugs	4
Ball Bearing	L5555-2	2 lb. Plastic Bottles	12
	L5555-7	7 lb. Jugs	4
Friction	L130-AA-6	6 lb. Tubs	4
	L130-AA-10	10 oz. Plastic Tubes	36
	L130-AA-14	14 oz. Cans	24
Friction	L630-AA-6	6 lb. Tubs	4
	L630-AA-10	10 oz. Plastic Tubes	36
	L630-AA-14	14 oz. Cans	24
	L630-AA-35	5 Gallon Pail	1
	L630-AA-55	55 Gallon Drum	1



GORTITE® DIE SET SHIELDS

Gortite® Bellows-Type Die Set Shields extend die set life and increase operator safety even in the highest speed applications. Installed over the guide pins and bushings as shown, they protect these components against damage from abrasive particles, scrap, and scale.

Gortite® shields are manufactured of heavy-duty, oil-resistant, Neoprene coated nylon. Shields come in standard lengths and diameters complete with back-up mounting plate and clamp.



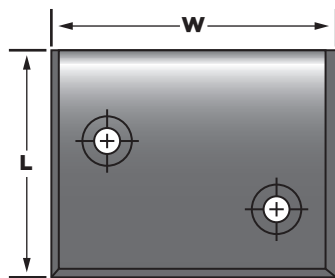
Pin Dia.	FRICTION BEARING BUSHING		BALL BEARING BUSHING	
	Shoulder	Sleeve	Shoulder	Sleeve
3/4"	DSA	DSA	DSA	W035010
1"	DSB		DSC	DSB
1-1/4"	DSC	DSB	DSD	DSD
1-1/2"	DSD	DSC	DSE	DSE
1-3/4"	DSE	DSD	DSF	
2"	DSF	DSE	DSG	DSF
2-1/2"	DSG	DSF	—	DSG

Part No.	A	B	C	D	E
	Inside Dia.	Outside Dia.	Maximum Length	Minimum Length	Collar ID Range
DSA	1-1/2"	2-1/2"	11"	1-1/2"	1-3/8 to 1-5/8"
DSA-18			18"	3"	
DSB	1-3/4"	2-3/4"	11"	1-1/2"	1-5/8 to 1-7/8"
DSB-18			18"	3"	
DSC	2"	3"	11"	1-1/2"	1-7/8 to 2"
DSC-18			18"	3"	
DSD	2-1/4"	3-1/4"	11"	1-1/2"	2-1/8 to 2-3/8"
DSD-18			18"	3"	
DSE	2-3/4"	3-3/4"	11"	1-1/2"	2-1/2 to 2-3/4"
DSE-18			18"	3"	
DSF	3"	4"	11"	1-1/2"	2-7/8 to 3-1/8"
DSF-18			18"	3"	
DSG	3-1/2"	4-1/2"	11"	1-1/2"	3-3/8 to 3-5/8"
DSG-18			18"	3"	

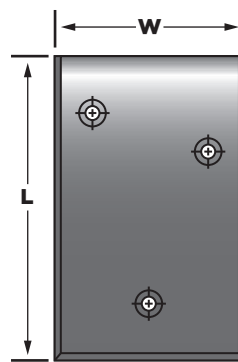
WEAR PLATES — N SERIES

Wear plates are typically fastened to heel block die set styles to help control linear motion during the stamping process. Superior offers two series of standard wear plates: N Series and NAAMS.

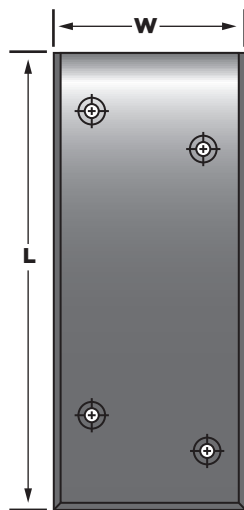
N SERIES: Wear plates are available in five standard types: hardened steel, steel with self-lubricating graphite plugs, bronze with grease grooves, bronze without grease grooves, and bronze with self-lubricating graphite plugs. Multiple hole patterns are offered for easy mounting and design. These wear plates conform to the automotive “N” series industry standards in “inch” sizes. Other types are also available upon request.



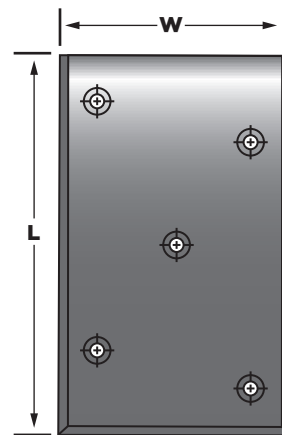
TYPE A



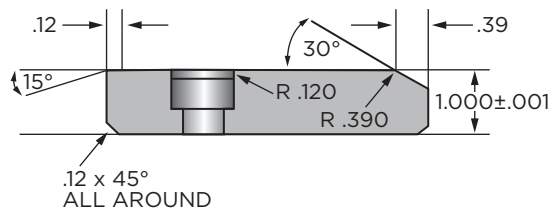
TYPE B



TYPE C



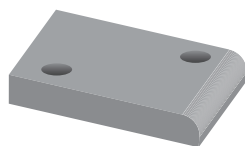
TYPE D



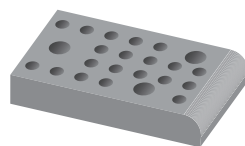
ALL SCREW HOLES 1/2" SHCS
9/16" DRILL THROUGH AND
3/16" COUNTERBORE x .36 DEEP

WEAR PLATES – N SERIES

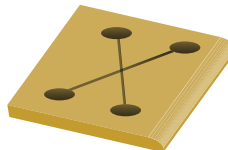
Steel Plain	Steel w/ Graphite	Bronze w/ Grease Grooves	Bronze w/o Grease Grooves	Bronze w/ Graphite	W	L	SCREW HOLES				
							Holes	Type			
NSX82508	NSG82508	NY82508X	NYX82508	NYG82508	2.5	8	2	A			
NSX83025	NSG83025	NY83025X	NYX83025	NYG83025	3	2.5					
NSX8303	NSG8303	NY8303X	NYX8303	NYG8303		3					
NSX8304	NSG8304	NY8304X	NYX8304	NYG8304		4					
NSX8305	NSG8305	NY8305X	NYX8305	NYG8305		5					
NSX8306	NSG8306	NY8306X	NYX8306	NYG8306		6					
NSX8308	NSG8308	NY8308X	NYX8308	NYG8308		8					
NSX8310	NSG8310	NY8310X	NYX8310	NYG8310		10					
NSX8312	NSG8312	NY8312X	NYX8312	NYG8312		12					
NSX84025	NSG84025	NY84025X	NYX84025	NYG84025		4			2.5	2	A
NSX8403	NSG8403	NY8403X	NYX8403	NYG8403	3						
NSX8404	NSG8404	NY8404X	NYX8404	NYG8404	4						
NSX8405	NSG8405	NY8405X	NYX8405	NYG8405	5						
NSX8406	NSG8406	NY8406X	NYX8406	NYG8406	6						
NSX8408	NSG8408	NY8408X	NYX8408	NYG8408	8						
NSX8410	NSG8410	NY8410X	NYX8410	NYG8410	10						
NSX8412	NSG8412	NY8412X	NYX8412	NYG8412	12						
NSX85025	NSG85025	NY85025X	NYX85025	NYG85025	5		2.5	2	A		
NSX8504	NSG8504	NY8504X	NYX8504	NYG8504			4				
NSX8505	NSG8505	NY8505X	NYX8505	NYG8505		5					
NSX8506	NSG8506	NY8506X	NYX8506	NYG8506		6					
NSX8508	NSG8508	NY8508X	NYX8508	NYG8508		8					
NSX8510	NSG8510	NY8510X	NYX8510	NYG8510		10					
NSX8512	NSG8512	NY8512X	NYX8512	NYG8512		12					
NSX86025	NSG86025	NY86025X	NYX86025	NYG86025		6	2.5			2	A
NSX8603	NSG8603	NY8603X	NYX8603	NYG8603			3			3	B
NSX8604	NSG8604	NY8604X	NYX8604	NYG8604			4			3	B
NSX8605	NSG8605	NY8605X	NYX8605	NYG8605	5		2	A			
NSX8606	NSG8606	NY8606X	NYX8606	NYG8606	6		4	C			
NSX8608	NSG8608	NY8608X	NYX8608	NYG8608	8						
NSX8610	NSG8610	NY8610X	NYX8610	NYG8610	10		5	D			
NSX8612	NSG8612	NY8612X	NYX8612	NYG8612	12						
NSX88025	NSG88025	NY88025X	NYX88025	NYG88025	8		2.5	2	A		
NSX8805	NSG8805	NY8805X	NYX8805	NYG8805			5				
NSX8806	NSG8806	NY8806X	NYX8806	NYG8806		10	6			4	C
NSX810025	NSG810025	NY810025X	NYX810025	NYG810025	2.5		2	A			



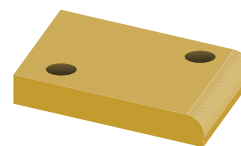
NSX
Steel (Plain)



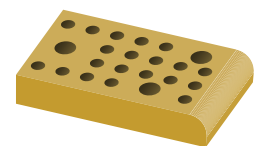
NSG
Steel with Graphite



NY ___ X
Bronze with Grease Grooves



NYX
Bronze without Grease Grooves



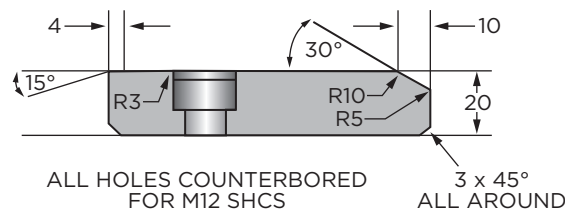
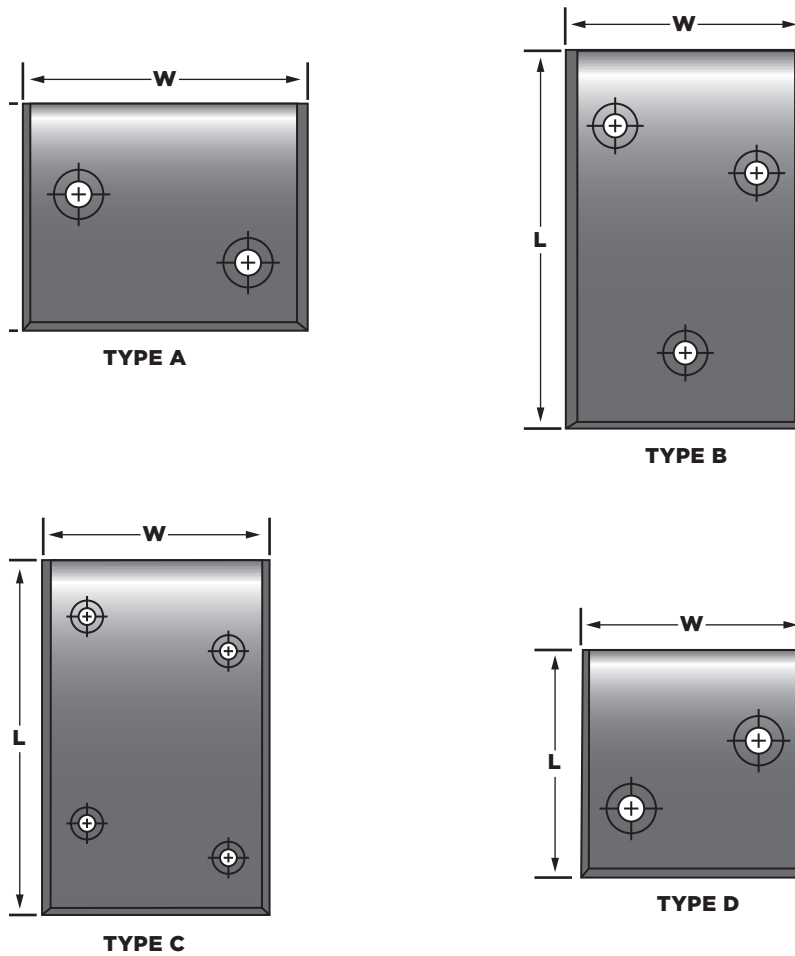
NYG
Bronze with Graphite

Hardened to 60 RC ± 2

ACCESSORIES

WEAR PLATES – NAAMS

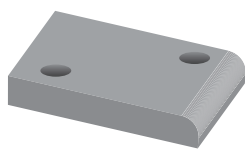
NAAMS: Wear plates are available in five standard types: hardened steel, steel with self-lubricating graphite plugs, bronze with grease grooves, bronze without grease grooves, and bronze with self-lubricating graphite plugs. Multiple hole patterns are offered for easy mounting and design. These wear plates conform to the automotive “NAAMS” series industry standards in ‘metric’ sizes. Other types are also available upon request.



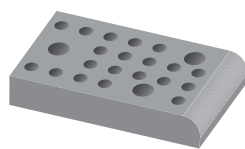
WEAR PLATES – NAAMS

Steel Plain	Steel w/ Graphite	Bronze w/ Grease Grooves	Bronze w/o Grease Grooves	Bronze w/ Graphite	W	L	SCREW HOLES	
							Holes	Type
W025010	W015010	W035010X	W03X5010	W035010	50	100	2	A
W025015	W015015	W035015X	W03X5015	W035015		150		
W025020	W015020	W035020X	W03X5020	W035020		200		
W028010	W018010	W038010X	W03X8010	W038010		100		
W028015	W018015	W038015X	W03X8015	W038015	80	150	2	A
W028020	W018020	W038020X	W03X8020	W038020		200		
W028025	W018025	W038025X	W03X8025	W038025		250		
W028031	W018031	W038031X	W03X8031	W038031		315		
W021050	W011050	W031050X	W03X1050	W031050	100	50	2	D
W021080	W011080	W031080X	W03X1080	W031080		80	2	A
W021010	W011010	W031010X	W03X1010	W031010		100		
W021015	W011015	W031015X	W03X1015	W031015		150	3	B
W021020	W011020	W031020X	W03X1020	W031020		200		
W021025	W011025	W031025X	W03X1025	W031025		250	2	D
W021031	W011031	W031031X	W03X1031	W031031		315		
W021280	W011280	W031280X	W03X1280	W031280		125	80	2
W021210	W011210	W031210X	W03X1210	W031210	100			
W021215	W011215	W031215X	W03X1215	W031215	150			
W021220	W011220	W031220X	W03X1220	W031220	200		3	B
W021225	W011225	W031225X	W03X1225	W031225	250			
W021231	W011231	W031231X	W03X1231	W031231	315		4	C
W021610	W011610	W031610X	W03X1610	W031610	160	100	2	A
W021615	W011615	W031615X	W03X1615	W031615		150		
W021620	W011620	W031620X	W03X1620	W031620		200	3	B
W021625	W011625	W031625X	W03X1625	W031625		250	4	C
W021631	W011631	W031631X	W03X1631	W031631		315		

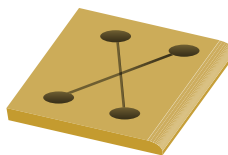
ACCESSORIES



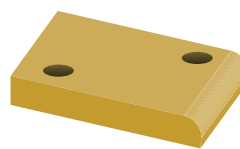
W02
Steel (Plain)



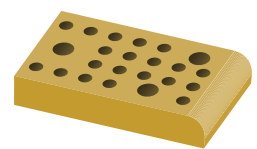
W01
Steel with Graphite



W03 X
Bronze with Grease Grooves



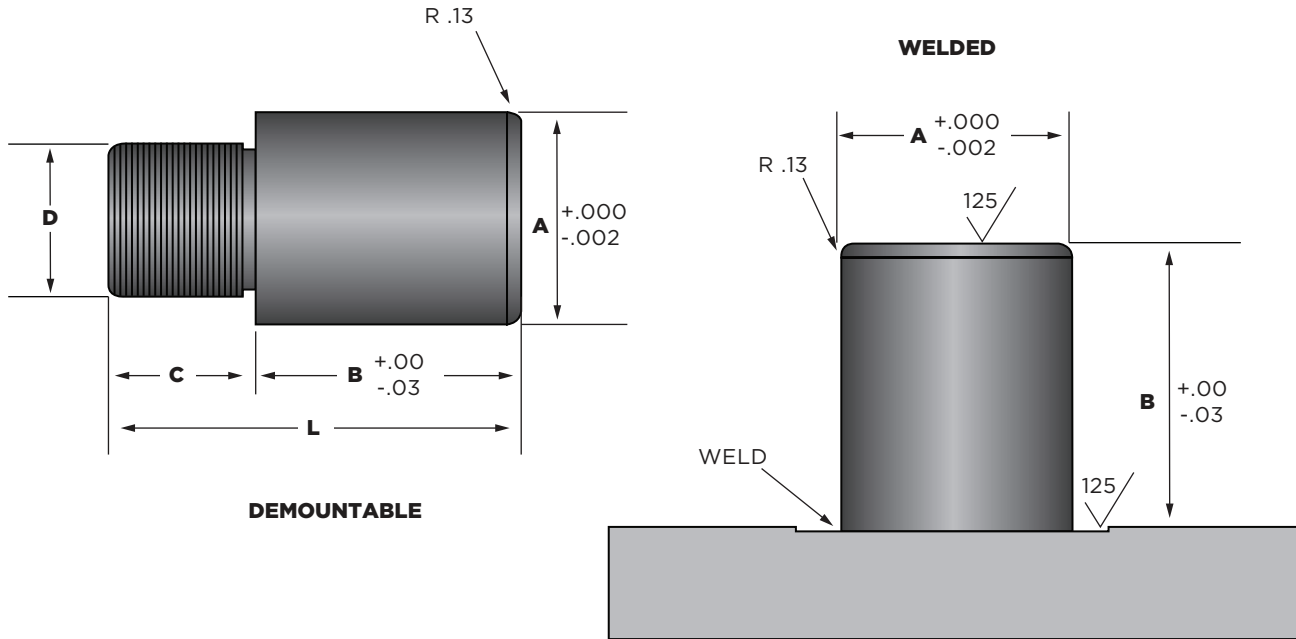
W03X
Bronze without Grease Grooves



W03
Bronze with Graphite

Hardened to 60 RC ± 2

SHANKS



ACCESSORIES

Dia.	A	B	Welded Part No.	C	L	D	Demountable Part. No.
1"	1.000	1.50	390-1624	0.88	2.38	3/4"-14	392-1624
1-1/2"	1.500	2.12	390-2434		3.00		392-2434
1-9/16"	1.562		390-2534		3.38		392-2534
2"	2.000	2.50	390-3240		3.75		392-3240
		2.88	390-3246	3.88	392-3246		
2-1/2"	2.500	2.50	390-4040	1.38	4.25	1-1/4"-12	392-4040
		2.88	390-4046				392-4046
3"	3.000	2.88	390-4846		392-4846		
			390-4846		392-4846		

NOTE: Special Sizes available upon request.

Shanks are available on all die sets in either welded or removable styles. Both are located in the center of the die set work area unless otherwise noted. All shanks should be used strictly for positioning purposes only – not for clamping. Welded shanks feature a deep penetration circumference weld into the plate surface. Demountable shanks can be taken off the plate for easier machining or die maintenance. Demountable shanks are considered “standard” and provided unless otherwise specified.

SUPERIOR COMPONENTS AND THE SUPERIOR **TRUE-BLUE COMMITMENT**

For over 100 years, Superior Die Set Corporation was a trusted name in the tool and die industries, recognized by its signature blue—a symbol of quality, reliability, and dedication. While Superior Die Set Corporation closed its doors in 2023, Superior Components and Manufacturing Services LLC was founded by family members, molded from the history of the company we share a name with. We proudly carry forward this legacy with the Superior True-Blue Commitment.

This Commitment is our promise to customer care, innovation, and teamwork. We stand behind our products and our customers by providing:

- **Extensive Inventory:** We've invested over \$2,000,000 in tens of thousands of standard inventory items like pins, bushings, cages, and more—all ready to ship the same day for orders placed before 2 PM CST.
- **Custom Solutions:** We embrace the challenge of creating custom solutions for unique manufacturing needs, because we understand that non-standard problems often require non-standard solutions.
- **Innovation:** We actively develop new products to help our customers win jobs, build better tools, and keep presses running efficiently.
- **Superior Standards:** All our products conform to our published specifications or customer-approved drawings, ensuring the highest quality, compatibility, and reliability. Replacements will be provided if they do not.
- **Reliable Delivery:** We prioritize fast delivery and maintain open communication with our customers, even when challenges arise.

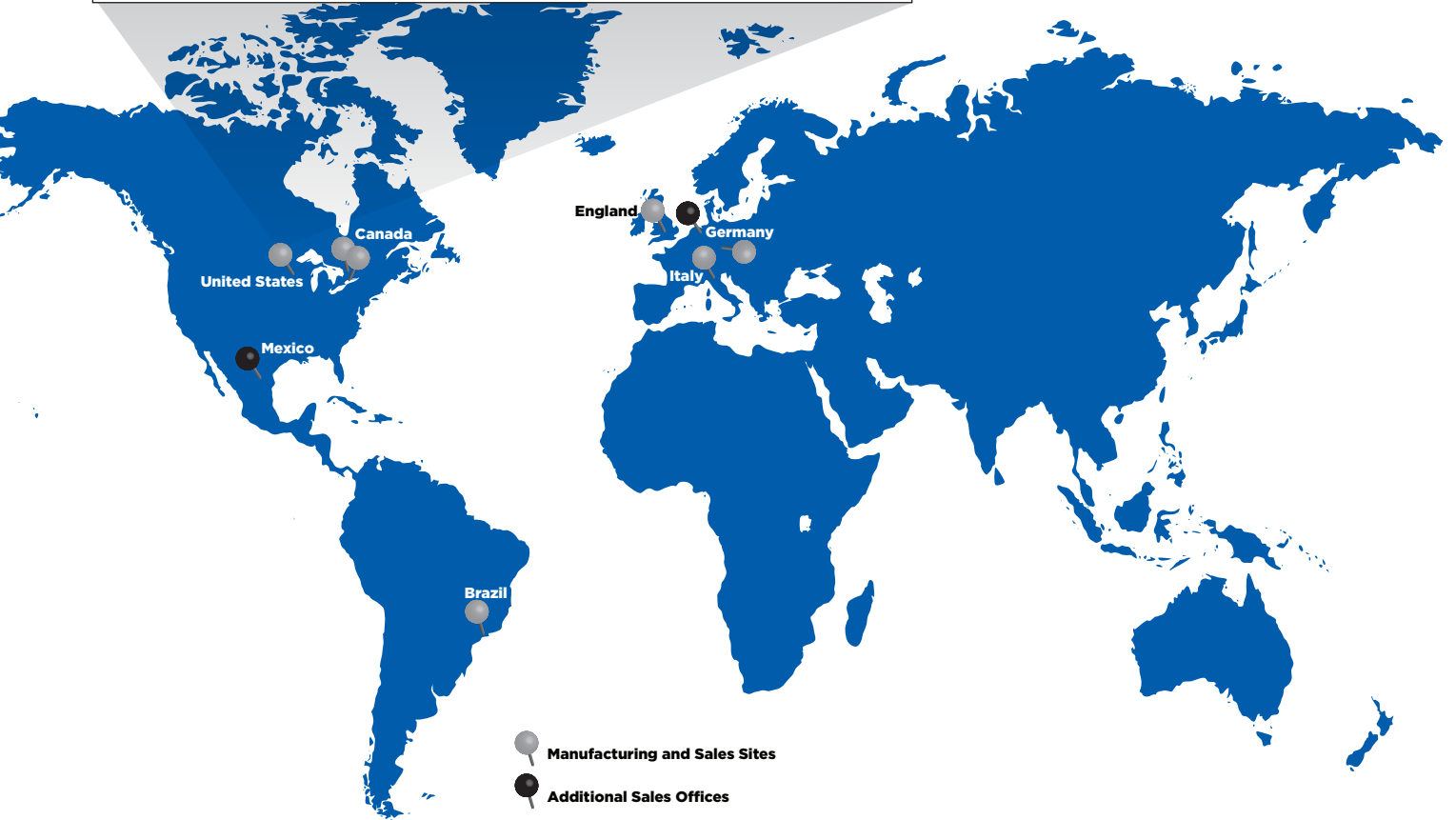
The True-Blue Commitment is reflected in every interaction with you, including phone calls, emails, shipments, site visits and handshakes. We are truly excited for the future and working together with you.



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GUARANTEED TO OUTPERFORM

With Wilson Tool International, you're not just receiving tools — you're gaining a partner dedicated to your productivity, and products backed with a guarantee to outperform your current tooling.



S462C 3.2026