

68 Years of Service

Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing



Spring & Ball Plungers



Clamping & Set Up



Stainless Steel Components



Washers



Knobs & Handles



Thread Inserts



Fixturing, Locating & Leveling Pads



Tooling Blocks



Grippers



Toggle Clamps



Hoist Rings



Northwestern Tools, Inc.

SERVICE • QUALITY

You can depend on Northwestern to give you prompt service, a quality product, at a reasonable price. With one of the largest inventories in the industry, and a nationwide network of industrial distributors, our products are there when you need them.

This catalog describes Northwestern's complete line of quality products. These products are made by skilled craftsmen from the finest materials available and their prices are kept reasonable thru mass production. In addition to the standard tools shown, many special sizes can be furnished, often at only slightly higher costs.

Because competition is so keen in today's tool market, it will pay you to check carefully the possibility of lowering costs and increasing profits through the use of Northwestern's "Time-Savers for Toolmakers."

GENERAL INFORMATION

FINISH & MATERIAL

Black Oxide MIL-C-13924 C

Zinc Plate - QQ - Z - 325

Heat Treatment - Carbonitride or Carburize & Harden

Steel CRS 1018, 1117, 12L14, ASTM A-108, 1141

ASTMA 311B, SAE319, 303, SAE319

Delrin® and Viton® are registered trademarks of DuPont.

IDA Manufacturer Number 698050.

CAGE (FSCM) 96027

This catalog cancels previous issues, and is subject to revision without notice.

TCMAI

All items noted conform to Tooling Component Manufacturers Association International standards.

These standards have been established to provide interchangeability between the components of various manufacturers.

Since the conditions of end use are beyond the control of Northwestern, performance of the product cannot be guaranteed. Liability is limited to replacement of the product.

**Toll - Free Number
800-236-3956**

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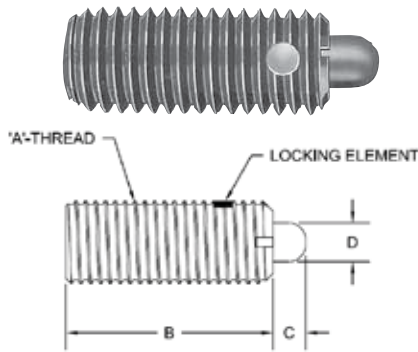
Northwestern



Spring & Ball Plungers



Spring & Ball Plungers



Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

Delrin® and Phenolic noses prevent marring of aluminum, brass or other soft materials.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

Phenolic Nose	
Part No.	Without Lock. Ele.
33021	33021P
33023	33023P
33025	33025P
33025A	33025AP
33027	33027P
33029	33029P
33031	33031P
33033	33033P

Phenolic Nose	
Part No.	Without Lock. Ele.
33321	33321P
33323	33323P
33325	33325P
33325A	33325AP
33327	33327P
33329	33329P
33331	33331P
33333	33333P

Standard Length Spring Plungers

Heavy Spring Pressures

Heat Treated Black Oxide Steel Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	+.001 -.002 D	Net lbs Per 100
		Start	Full					
33101	33101P	1.5	4.5	6-32	17/32	.062	.046	1/2
33102	33102P	1.0	1.6	6-32	3/8	.062	.046	1/2
33103	33103P	2.7	7.3	8-32	5/8	.093	.070	1/2
33105	33105P	2.9	11.1	10-32	3/4	.125	.093	1/2
33107	33107P	3.0	13.0	1/4-20	1	.187	.119	1
33108	33108P	3.0	13.0	1/4-28	1	.187	.119	1
33109	33109P	2.0	9.0	1/4-20	3/4	.125	.119	1
33111	33111P	3.0	15.0	5/16-18	1	.187	.135	2
33113	33113P	5.5	14.5	3/8-16	1-1/8	.187	.186	2
33115	33115P	6.6	17.4	1/2-13	1-1/4	.250	.248	5
33117	33117P	10.5	25.5	5/8-11	1-1/2	.312	.310	8
33119	33119P	6.7	37.3	3/4-10	1-3/4	.312	.374	14
33120	33120P	16.0	68.0	1-8	2-13/32	.500	.499	34

Brown Delrin® Nose

33001	33001P	2.7	7.3	8-32	5/8	.093	.070	1/2
33003	33003P	2.9	11.1	10-32	3/4	.125	.093	1/2
33005	33005P	3.0	13.0	1/4-20	1	.187	.119	1
33005A	33005AP	3.0	13.0	1/4-28	1	.187	.119	1
33007	33007P	3.0	15.0	5/16-18	1	.187	.135	1-1/2
33009	33009P	5.5	14.5	3/8-16	1-1/8	.187	.186	2
33011	33011P	6.6	17.4	1/2-13	1-1/4	.250	.248	4
33013	33013P	10.5	25.5	5/8-11	1-1/2	.312	.310	7

All Parts Conform to TCMAl Standards

Light Spring Pressures

Heat Treated Zinc Plate Steel Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	+.001 -.002 D	Net lbs Per 100
		Start	Full					
33201	33201P	0.5	1.5	6-32	17/32	.062	.046	1/2
33202	33202P	0.7	2.3	8-32	5/8	.093	.070	1/2
33204	33204P	1.3	2.7	10-32	3/4	.125	.093	1/2
33206	33206P	1.0	4.0	1/4-20	1	.187	.119	1
33207	33207P	1.0	4.0	1/4-28	1	.187	.119	1
33209	33209P	1.5	4.5	5/16-18	1	.187	.135	1-1/2
33211	33211P	2.8	7.2	3/8-16	1-1/8	.187	.186	2
33213	33213P	2.7	9.3	1/2-13	1-1/4	.250	.248	4-1/2
33215	33215P	3.5	10.5	5/8-11	1-1/2	.312	.310	8
33217	33217P	4.0	16.0	3/4-10	1-3/4	.312	.374	14
33218	33218P	4.0	31.0	1-8	2-13/32	.500	.499	34

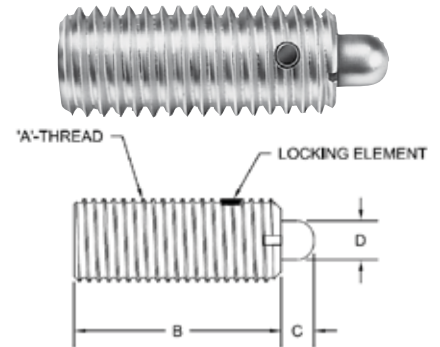
White Delrin® Nose

33301	33301P	0.7	2.3	8-32	5/8	.093	.070	1/2
33303	33303P	1.3	2.7	10-32	3/4	.125	.093	1/2
33305	33305P	1.0	4.0	1/4-20	1	.187	.119	1
33305A	33305AP	1.0	4.0	1/4-28	1	.187	.119	1
33307	33307P	1.5	4.5	5/16-18	1	.187	.135	1-1/2
33309	33309P	2.8	7.2	3/8-16	1-1/8	.187	.186	2
33311	33311P	2.7	9.3	1/2-13	1-1/4	.250	.248	4
33313	33313P	3.5	10.5	5/8-11	1-1/2	.312	.310	7

Stainless Steel Spring Plungers

Standard Lengths (With Heavy Spring Pressures)									
Stainless Nose									
Part No.	Without Lock. Ele.	Color Code	End Pressures Pounds		A	B	C	+001 -002 D	Net lbs Per 100
			Start	Full					
33400	33400P	Yellow	1.5	4.5	6-32	17/32	.062	.046	1/2
33401	33401P	Plain	1.0	1.6	6-32	3/8	.062	.046	1/2
33403	33403P	Yellow	2.7	7.3	8-32	5/8	.093	.070	1/2
33404	33404P	Yellow	2.9	11.1	10-32	3/4	.125	.093	1/2
33405	33405P	Yellow	3.0	13.0	1/4-20	1	.187	.119	1
33406	33406P	Yellow	3.0	13.0	1/4-28	1	.187	.119	1
33407	33407P	Plain	2.0	9.0	1/4-20	3/4	.125	.119	1
33408	33408P	Yellow	3.0	15.0	5/16-18	1	.187	.135	2
33409	33409P	Yellow	5.5	14.5	3/8-16	1-1/8	.187	.186	2
33410	33410P	Yellow	6.6	17.4	1/2-13	1-1/4	.250	.248	5
Brown Delrin® Nose									
33443	33443P	Plain	2.7	7.3	8-32	5/8	.093	.070	1/2
33444	33444P	Plain	2.9	11.1	10-32	3/4	.125	.093	1/2
33445	33445P	Plain	3.0	13.0	1/4-20	1	.187	.119	1
33446	33446P	Plain	3.0	13.0	1/4-28	1	.187	.119	1
33448	33448P	Plain	3.0	15.0	5/16-18	1	.187	.135	2
33449	33449P	Plain	5.5	14.5	3/8-16	1-1/8	.187	.186	2
33450	33450P	Plain	6.6	17.4	1/2-13	1-1/4	.250	.248	5
Standard Lengths (With Light Spring Pressures)									
Stainless Nose									
33500	33500P	Plain	0.5	1.5	6-32	17/32	.062	.046	1/2
33503	33503P	Plain	0.7	2.3	8-32	5/8	.093	.070	1/2
33504	33504P	Plain	1.3	2.7	10-32	3/4	.125	.093	1/2
33505	33505P	Plain	1.0	4.0	1/4-20	1	.187	.119	1
33506	33506P	Plain	1.0	4.0	1/4-28	1	.187	.119	1
33508	33508P	Plain	1.5	4.5	5/16-18	1	.187	.135	1-1/2
33509	33509P	Plain	2.8	7.2	3/8-16	1-1/8	.187	.186	2
33510	33510P	Plain	2.7	9.3	1/2-13	1-1/4	.250	.248	5
White Delrin® Nose									
33543	33543P	Plain	0.7	2.3	8-32	5/8	.093	.070	1/2
33544	33544P	Plain	1.3	2.7	10-32	3/4	.125	.093	1/2
33545	33545P	Plain	1.0	4.0	1/4-20	1	.187	.119	1
33546	33546P	Plain	1.0	4.0	1/4-28	1	.187	.119	1
33548	33548P	Plain	1.5	4.5	5/16-18	1	.187	.135	1-1/2
33549	33549P	Plain	2.8	7.2	3/8-16	1-1/8	.187	.186	2
33550	33550P	Plain	2.7	9.3	1/2-13	1-1/4	.250	.248	5
Short Lengths (With Heavy Spring Pressures)									
Stainless Nose									
33420	33420P	Yellow	1.5	4.75	8-32	7/16	.052	.070	1/2
33421	33421P	Yellow	1.5	4.75	8-36	7/16	.052	.070	1/2
33422	33422P	Yellow	1.75	6.25	10-32	15/32	.065	.093	1/2
33423	33423P	Yellow	3.0	10.5	1/4-20	17/32	.078	.119	1/2
33424	33424P	Yellow	3.75	15.5	5/16-18	9/16	.084	.135	1
33425	33425P	Yellow	4.5	18.5	3/8-16	5/8	.110	.186	2
33426	33426P	Yellow	5.0	28.0	1/2-13	3/4	.151	.248	3
Brown Delrin® Nose									
33460	33460P	Plain	1.5	4.75	8-32	7/16	.052	.070	1/2
33461	33461P	Plain	1.5	4.75	8-36	7/16	.052	.070	1/2
33462	33462P	Plain	1.75	6.25	10-32	15/32	.065	.093	1/2
33463	33463P	Plain	3.0	10.5	1/4-20	17/32	.078	.119	1/2
33464	33464P	Plain	3.75	15.5	5/16-18	9/16	.084	.135	1
33465	33465P	Plain	4.5	18.5	3/8-16	5/8	.110	.186	2
33466	33466P	Plain	5.0	28.0	1/2-13	3/4	.151	.248	3
Short Lengths (With Light Spring Pressures)									
Stainless Nose									
33520	33520P	Plain	0.5	1.5	8-32	7/16	.052	.070	1/2
33521	33521P	Plain	0.5	1.5	8-36	7/16	.052	.070	1/2
33522	33522P	Plain	0.75	2.5	10-32	15/32	.065	.093	1/2
33523	33523P	Plain	1.0	3.5	1/4-20	17/32	.078	.119	1/2
33524	33524P	Plain	1.5	4.0	5/16-18	9/16	.084	.135	1
33525	33525P	Plain	1.5	5.0	3/8-16	5/8	.110	.186	2
33526	33526P	Plain	1.75	5.5	1/2-13	3/4	.151	.248	3
White Delrin® Nose									
33560	33560P	Plain	0.5	1.5	8-32	7/16	.052	.070	1/2
33561	33561P	Plain	0.5	1.5	8-36	7/16	.052	.070	1/2
33562	33562P	Plain	0.75	2.5	10-32	15/32	.065	.093	1/2
33563	33563P	Plain	1.0	3.5	1/4-20	17/32	.078	.119	1/2
33564	33564P	Plain	1.5	4.0	5/16-18	9/16	.084	.135	1
33565	33565P	Plain	1.5	5.0	3/8-16	5/8	.110	.186	2
33566	33566P	Plain	1.75	5.5	1/2-13	3/4	.151	.248	3

Long Length



All stainless parts are made of 303 material.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

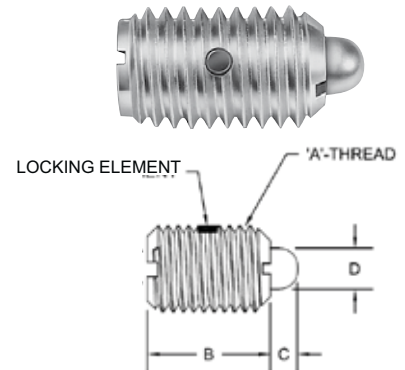
End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

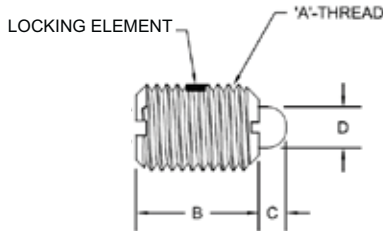
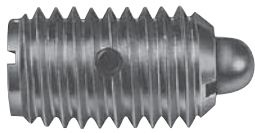
In addition to the standard components shown in this catalog, special sizes can also be furnished. Send print or drawing for quotation.

Stainless "P" Plungers are not color coded.

Short Length



Short Spring Plungers



Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

Delrin® noses prevent marring of aluminum, brass or other soft materials.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered “specials” and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32” larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in “C” column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See page 35.

Heat Treated Black Oxide Steel Nose - Heavy Pressure

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33100	33100P	1.5	4.75	8-32	7/16	.052	.070	1/2
33104	33104P	1.5	4.75	8-36	7/16	.052	.070	1/2
33106	33106P	1.75	6.25	10-32	15/32	.065	.093	1/2
33110	33110P	3.0	10.5	1/4-20	17/32	.078	.119	1/2
33112	33112P	3.75	15.5	5/16-18	9/16	.084	.135	1
33114	33114P	4.5	18.5	3/8-16	5/8	.110	.186	2
33116	33116P	5.0	28.0	1/2-13	3/4	.151	.248	3
33118	33118P	7.0	50.0	5/8-11	1-1/16	.215	.310	6

Brown Delrin® Nose - Heavy Pressure

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33000	33000P	1.5	4.75	8-32	7/16	.052	.070	1/2
33002	33002P	1.5	4.75	8-36	7/16	.052	.070	1/2
33004	33004P	1.75	6.25	10-32	15/32	.065	.093	1/2
33006	33006P	3.0	10.5	1/4-20	17/32	.078	.119	1/2
33008	33008P	3.75	15.5	5/16-18	9/16	.084	.135	1
33010	33010P	4.5	18.5	3/8-16	5/8	.110	.186	1
33012	33012P	5.0	28.0	1/2-13	3/4	.151	.248	2
33014	33014P	7.0	50.0	5/8-11	1-1/16	.215	.310	5

Heat Treated Zinc Plated Steel Nose - Light Pressure

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33200	33200P	0.5	1.5	8-32	7/16	.052	.070	1/2
33002	33002P	0.5	1.5	8-36	7/16	.052	.070	1/2
33004	33004P	0.75	2.5	10-32	15/32	.065	.093	1/2
33006	33006P	1.0	3.5	1/4-20	17/32	.078	.119	1/2
33008	33008P	1.5	4.0	5/16-18	9/16	.084	.135	1
33010	33010P	1.5	5.0	3/8-16	5/8	.110	.186	1-1/2
33012	33012P	1.75	5.5	1/2-13	3/4	.151	.248	2-1/2
33014	33014P	2.0	8.5	5/8-11	1-1/16	.215	.310	6

White Delrin® Nose - Light Pressure

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33300	33300P	0.5	1.5	8-32	7/16	.052	.070	1/2
33302	33302P	0.5	1.5	8-36	7/16	.052	.070	1/2
33304	33304P	0.75	2.5	10-32	15/32	.065	.093	1/2
33306	33306P	1.0	3.5	1/4-20	17/32	.078	.119	1/2
33338	33338P	1.5	4.0	5/16-18	9/16	.084	.135	1
33310	33310P	1.5	5.0	3/8-16	5/8	.110	.186	1
33312	33312P	1.75	5.5	1/2-13	3/4	.151	.248	2
33314	33314P	2.0	8.5	5/8-11	1-1/16	.215	.310	5

All parts conform to TCMAI Standards

Ask for quoted price for 500 or more of any one item.

For more information, check out our website:

www.northwesternertools.com

Short Spring Plungers with Extended Travel

Steel Body - Heat Treated Black Oxide Steel Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33135	33135P	1.0	3.25	8-32	7/16	.093	.070	1/2
33136	33136P	1.0	3.25	8-36	7/16	.093	.070	1/2
33137	33137P	1.25	4.25	10-32	15/32	.125	.093	1/2
33138	33138P	2.0	7.0	1/4-20	17/32	.187	.119	1/2
33139	33139P	2.0	9.0	5/16-18	9/16	.187	.135	1
33140	33140P	3.0	12.5	3/8-16	5/8	.187	.186	2
33141	33141P	3.5	19.0	1/2-13	3/4	.250	.248	3
33142	33142P	4.5	33.5	5/8-11	1-1/16	.312	.310	6

Steel Body - Brown Delrin® Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33035	33035P	1.0	3.25	8-32	7/16	.093	.070	1/2
33036	33036P	1.0	3.25	8-36	7/16	.093	.070	1/2
33037	33037P	1.25	4.25	10-32	15/32	.125	.093	1/2
33038	33038P	2.0	7.0	1/4-20	17/32	.187	.119	1/2
33039	33039P	2.0	9.0	5/16-18	9/16	.187	.135	1
33040	33040P	3.0	12.5	3/8-16	5/8	.187	.186	1
33041	33041P	3.5	19.0	1/2-13	3/4	.250	.248	2
33042	33042P	4.5	33.5	5/8-11	1-1/16	.312	.310	5

Stainless Steel Body - Stainless Steel Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33145	33145P	1.0	3.25	8-32	7/16	.093	.070	1/2
33146	33146P	1.0	3.25	8-36	7/16	.093	.070	1/2
33147	33147P	1.25	4.25	10-32	15/32	.125	.093	1/2
33148	33148P	2.0	7.0	1/4-20	17/32	.187	.119	1/2
33149	33149P	2.0	9.0	5/16-18	9/16	.187	.135	1
33150	33150P	3.0	12.5	3/8-16	5/8	.187	.186	1-1/2
33151	33151P	3.5	19.0	1/2-13	3/4	.250	.248	2-1/2

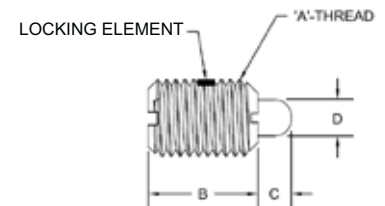
Stainless Steel Body - Brown Delrin® Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Net lbs Per 100
		Start	Full					
33045	33045P	1.0	3.25	8-32	7/16	.093	.070	1/2
33046	33046P	1.0	3.25	8-36	7/16	.093	.070	1/2
33047	33047P	1.25	4.25	10-32	15/32	.125	.093	1/2
33048	33048P	2.0	7.0	1/4-20	17/32	.187	.119	1/2
33049	33049P	2.0	9.0	5/16-18	9/16	.187	.135	1
33050	33050P	3.0	12.5	3/8-16	5/8	.187	.186	1
33051	33051P	3.5	19.0	1/2-13	3/4	.250	.248	2

The short spring plunger with extended travel provides the space saving features of a short body, along with the added nose travel of the standard length plunger. The nose travel (C column) and the diameter (D column) are identical to the standard spring plunger, with spring pressures midrange between the light and heavy short spring plunger. All short style plungers have the solid screwdriver slot.

Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.



All stainless parts are made of 303 material.

Delrin® noses prevent marring of aluminum, brass or other soft materials

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

Ask for quoted price for 500 or more of any one item.

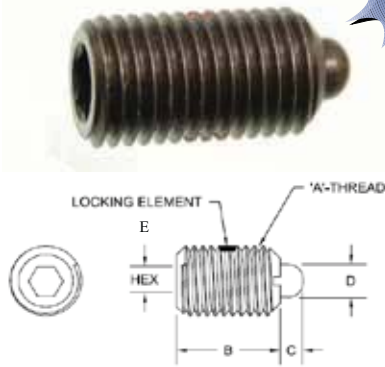
For more information, check out our website:

www.northwesterntools.com

NEW!

Hex Drive Short Stainless Steel Spring Plungers

Stainless Steel Nose - Heavy Pressure



Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33420H	33420HP	1.5	4.75	8-32	1/2	.052	.070	5/64	1/2
33421H	33421HP	1.5	4.75	8-36	1/2	.052	.070	5/64	1/2
33422H	33422HP	1.75	6.25	10-32	9/16	.065	.093	3/32	1/2
33423H	33423HP	3.0	10.5	1/4-20	5/8	.078	.119	1/8	1/2
33424H	33424HP	3.75	15.5	5/16-18	23/32	.084	.135	5/32	1
33425H	33425HP	4.5	18.5	3/8-16	29/32	.110	.186	3/16	2
33426H	33426HP	5.0	28.0	1/2-13	1-3/64	.151	.248	1/4	4
33427H	33427HP	7.0	50.0	5/8-11	1-3/8	.215	.310	5/16	8

Brown Delrin® Nose - Heavy Pressure

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33460H	33460HP	1.5	4.75	8-32	1/2	.052	.070	5/64	1/2
33461H	33461HP	1.5	4.75	8-36	1/2	.052	.070	5/64	1/2
33462H	33462HP	1.75	6.25	10-32	9/16	.065	.093	3/32	1/2
33463H	33463HP	3.0	10.5	1/4-20	5/8	.078	.119	1/8	1/2
33464H	33464HP	3.75	15.5	5/16-18	23/32	.084	.135	5/32	1
33465H	33465HP	4.5	18.5	3/8-16	29/32	.110	.186	3/16	1-1/2
33466H	33466HP	5.0	28.0	1/2-13	1-3/64	.151	.248	1/4	3-1/2
33467H	33467HP	7.0	50.0	5/8-11	1-3/8	.215	.310	5/16	6-1/2

All stainless parts are made of 303 material.

Delrin® noses prevent marring of aluminum, brass or other soft materials.

Hex Drive Plungers use a positive drive for insertion and removal.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countesink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose to the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. Shown on page 35.

NEW!

Stainless Steel Nose - Light Pressure

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33520H	33520HP	0.5	1.5	8-32	1/2	.052	.070	5/64	1/2
33521H	33521HP	0.5	1.5	8-36	1/2	.052	.070	5/64	1/2
33522H	33522HP	0.75	2.5	10-32	9/16	.065	.093	3/32	1/2
33523H	33523HP	1.0	3.5	1/4-20	5/8	.078	.119	1/8	1/2
33524H	33524HP	1.5	4.0	5/16-18	23/32	.084	.135	5/32	1
33525H	33525HP	1.5	5.0	3/8-16	29/32	.110	.186	3/16	2
33526H	33526HP	1.75	5.5	1/2-13	1-3/64	.151	.248	1/4	4
33527H	33527HP	2.0	8.5	5/8-11	1-3/8	.215	.310	5/16	8

White Delrin® Nose - Light Pressure

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33560H	33560HP	0.5	1.5	8-32	1/2	.052	.070	5/64	1/2
33561H	33561HP	0.5	1.5	8-36	1/2	.052	.070	5/64	1/2
33562H	33562HP	0.75	2.5	10-32	9/16	.065	.093	3/32	1/2
33563H	33563HP	1.0	3.5	1/4-20	5/8	.078	.119	1/8	1/2
33564H	33564HP	1.5	4.0	5/16-18	23/32	.084	.135	5/32	1
33565H	33565HP	1.5	5.0	3/8-16	29/32	.110	.186	3/16	1-1/2
33566H	33566HP	1.75	5.5	1/2-13	1-3/64	.151	.248	1/4	3-1/2
33567H	33567HP	2.0	8.5	5/8-11	1-3/8	.215	.310	5/16	6-1/2

Ask for quoted price for 500 or more of any one item.

For more information, check out our website:

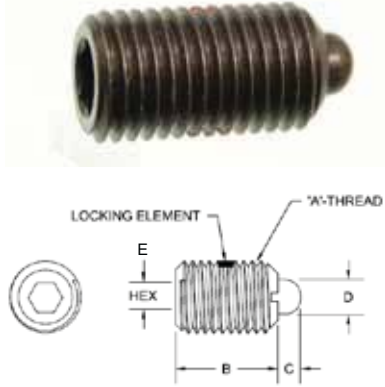
www.northwesterntools.com



Hex Drive Short Steel Spring Plungers

Steel Nose - Heavy Pressure									
Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33100H	33100HP	1.5	4.75	8-32	1/2	.052	.070	5/64	1/2
33104H	33104HP	1.5	4.75	8-36	1/2	.052	.070	5/64	1/2
33106H	33106HP	1.75	6.25	10-32	9/16	.065	.093	3/32	1/2
33110H	33110HP	3.0	10.5	1/4-20	5/8	.078	.119	1/8	1/2
33112H	33112HP	3.75	15.5	5/16-18	23/32	.084	.135	5/32	1
33114H	33114HP	4.5	18.5	3/8-16	29/32	.110	.186	3/16	2
33116H	33116HP	5.0	28.0	1/2-13	1-3/64	.151	.248	1/4	4
33118H	33118HP	7.0	50.0	5/8-11	1-3/8	.215	.310	5/16	8

Brown Delrin® Nose - Heavy Pressure									
Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33000H	33000HP	1.5	4.75	8-32	1/2	.052	.070	5/64	1/2
33002H	33002HP	1.5	4.75	8-36	1/2	.052	.070	5/64	1/2
33004H	33004HP	1.75	6.25	10-32	9/16	.065	.093	3/32	1/2
33006H	33006HP	3.0	10.5	1/4-20	5/8	.078	.119	1/8	1/2
33008H	33008HP	3.75	15.5	5/16-18	23/32	.084	.135	5/32	1
33010H	33010HP	4.5	18.5	3/8-16	29/32	.110	.186	3/16	1-1/2
33012H	33012HP	5.0	28.0	1/2-13	1-3/64	.151	.248	1/4	3-1/2
33014H	33014HP	7.0	50.0	5/8-11	1-3/8	.215	.310	5/16	6-1/2



Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

Delrin® noses prevent marring of aluminum, brass or other soft materials.

Hex Drive Plungers use a positive drive for insertion and removal.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose to the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. Shown on page 35.



Steel Zinc Nose - Light Pressure

Steel Zinc Nose - Light Pressure									
Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33200H	33200HP	0.5	1.5	8-32	1/2	.052	.070	5/64	1/2
33203H	33203HP	0.5	1.5	8-36	1/2	.052	.070	5/64	1/2
33205H	33205HP	0.75	2.5	10-32	9/16	.065	.093	3/32	1/2
33208H	33208HP	1.0	3.5	1/4-20	5/8	.078	.119	1/8	1/2
33210H	33210HP	1.5	4.0	5/16-18	23/32	.084	.135	5/32	1
33212H	33212HP	1.5	5.0	3/8-16	29/32	.110	.186	3/16	2
33214H	33214HP	1.75	5.5	1/2-13	1-3/64	.151	.248	1/4	4
33216H	33216HP	2.0	8.5	5/8-11	1-3/8	.215	.310	5/16	8

White Delrin® Nose - Light Pressure									
Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33300H	33300HP	0.5	1.5	8-32	1/2	.052	.070	5/64	1/2
33302H	33302HP	0.5	1.5	8-36	1/2	.052	.070	5/64	1/2
33304H	33304HP	0.75	2.5	10-32	9/16	.065	.093	3/32	1/2
33306H	33306HP	1.0	3.5	1/4-20	5/8	.078	.119	1/8	1/2
33308H	33308HP	1.5	4.0	5/16-18	23/32	.084	.135	5/32	1
33310H	33310HP	1.5	5.0	3/8-16	29/32	.110	.186	3/16	1-1/2
33312H	33312HP	1.75	5.5	1/2-13	1-3/64	.151	.248	1/4	3-1/2
33314H	33314HP	2.0	8.5	5/8-11	1-3/8	.215	.310	5/16	6-1/2

Ask for quoted price for 500 or more of any one item.

For more information, check out our website:

www.northwesterntools.com

Spring & Ball Plungers

The short spring plunger with extended travel provides the space saving features of a short body, along with the added nose travel of the standard length plunger. The nose travel (C column) and the diameter (D column) are identical to the standard spring plunger, with spring pressures midrange between the light and heavy short spring plunger.



Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

Delrin® noses prevent marring of aluminum, brass or other soft materials.

Hex Drive Plungers use a positive drive for insertion and removal.

All stainless parts are made of 303 material.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

To prevent possible spring damage use of a Northwestern Wrench is recommend when installing from plunger end. See Page 35.

NEW! Hex Drive Short Extended Travel Spring Plungers

Steel Body - Heat Treated Black Oxide Steel Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33134H	33134HP	0.5	1.25	6-32	7/16	.062	.046	3/64	1/2
33135H	33135HP	1.0	3.25	8-32	1/2	.093	.070	5/64	1/2
33136H	33136HP	1.0	3.25	8-36	1/2	.093	.070	5/64	1/2
33137H	33137HP	1.25	4.25	10-32	9/16	.125	.093	3/32	1/2
33138H	33138HP	2.0	7.0	1/4-20	5/8	.187	.119	1/8	1/2
33139H	33139HP	2.0	9.0	5/16-18	23/32	.187	.135	5/32	1
33140H	33140HP	3.0	12.5	3/8-16	29/32	.187	.186	3/16	2
33141H	33141HP	3.5	19.0	1/2-13	1-3/64	.250	.248	1/4	4
33142H	33142HP	4.5	33.5	5/8-11	1-3/8	.312	.310	5/16	8

Steel Body - Brown Delrin® Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33034H	33034HP	0.5	1.25	6-32	7/16	.062	.046	3/64	1/2
33035H	33035HP	1.0	3.25	8-32	1/2	.093	.070	5/64	1/2
33036H	33036HP	1.0	3.25	8-36	1/2	.093	.070	5/64	1/2
33037H	33037HP	1.25	4.25	10-32	9/16	.125	.093	3/32	1/2
33038H	33038HP	2.0	7.0	1/4-20	5/8	.187	.119	1/8	1/2
33039H	33039HP	2.0	9.0	5/16-18	23/32	.187	.135	5/32	1
33040H	33040HP	3.0	12.5	3/8-16	29/32	.187	.186	3/16	1-1/2
33041H	33041HP	3.5	19.0	1/2-13	1-3/64	.250	.248	1/4	3-1/2
33042H	33042HP	4.5	33.5	5/8-11	1-3/8	.312	.310	5/16	6-1/2

NEW! Stainless Steel Body - Stainless Steel Nose

Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33144H	33144HP	0.5	1.25	6-32	7/16	.062	.046	3/64	1/2
33145H	33145HP	1.0	3.25	8-32	1/2	.093	.070	5/64	1/2
33146H	33146HP	1.0	3.25	8-36	1/2	.093	.070	5/64	1/2
33147H	33147HP	1.25	4.25	10-32	9/16	.125	.093	3/32	1/2
33148H	33148HP	2.0	7.0	1/4-20	5/8	.187	.119	1/8	1/2
33149H	33149HP	2.0	9.0	5/16-18	23/32	.187	.135	5/32	1
33150H	33150HP	3.0	12.5	3/8-16	29/32	.187	.186	3/16	2
33151H	33151HP	3.5	19.0	1/2-13	1-3/64	.250	.248	1/4	4
33152H	33152HP	4.5	33.5	5/8-11	1-3/8	.312	.310	5/16	8

Stainless Steel Body - Brown Delrin® Nose

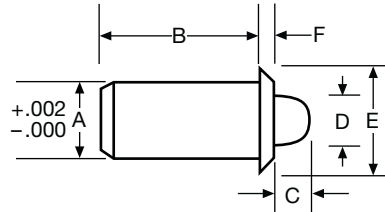
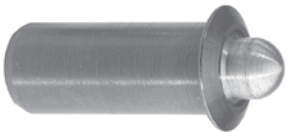
Part No.	Without Lock. Ele.	End Pressure Pounds		A	B	C	D	Hex Dia. E	Net lbs Per 100
		Start	Full						
33044H	33044HP	0.5	1.25	6-32	7/16	.062	.046	3/64	1/2
33045H	33045HP	1.0	3.25	8-32	1/2	.093	.070	5/64	1/2
33046H	33046HP	1.0	3.25	8-36	1/2	.093	.070	5/64	1/2
33047H	33047HP	1.25	4.25	10-32	9/16	.125	.093	3/32	1/2
33048H	33048HP	2.0	7.0	1/4-20	5/8	.187	.119	1/8	1/2
33049H	33049HP	2.0	9.0	5/16-18	23/32	.187	.135	5/32	1
33050H	33050HP	3.0	12.5	3/8-16	29/32	.187	.186	3/16	1-1/2
33051H	33051HP	3.5	19.0	1/2-13	1-3/64	.250	.248	1/4	3-1/2
33052H	33052HP	4.5	33.5	5/8-11	1-3/8	.312	.310	5/16	6-1/2

Ask for quoted price for 500 pieces or more of any one item.

**Press Fit
Spring Plungers**

Heavy Pressure										
Heat Treated Steel Nose - Black Oxide Finish / Stainless Nose										
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
10502	10526	1.0	2.0	.125	.252	.062	.070	.187	.032	1
10503	15027	1.25	3.25	.157	.330	.078	.093	.215	.035	1
10504	10528	1.5	4.5	.188	.405	.094	.121	.250	.035	1
10506	10530	2.5	6.0	.250	.481	.125	.168	.312	.044	1
10508	10532	4.0	10.0	.312	.643	.151	.186	.375	.045	1
10510	10534	5.0	14.0	.375	.785	.187	.234	.500	.078	2
10512	10536	8.0	18.0	.500	1.130	.250	.332	.688	.088	4

Heavy Pressure										
Brown Delrin® Nose										
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
10550	10574	1.0	2.0	.125	.252	.062	.070	.187	.032	1
10551	10575	1.25	3.25	.157	.330	.078	.093	.215	.035	1
10552	10576	1.5	4.5	.188	.405	.094	.121	.250	.035	1
10554	10578	2.5	6.0	.250	.481	.125	.168	.312	.044	1
10556	10580	4.0	10.0	.312	.643	.151	.186	.375	.045	1
10558	10582	5.0	14.0	.375	.785	.187	.234	.500	.078	2
10560	10584	8.0	18.0	.500	1.130	.250	.332	.688	.088	4



The Northwestern Press Fit Spring Plunger uses the same body dimensions as our Press Fit Ball Plunger. Northwestern has added these plungers to handle your longer travel needs with a press fit body.

Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

All stainless steel parts are made of 303 material.

A stainless steel part will withstand higher working temperatures.

Easy installation. Use in wood, soft plastic or aluminum applications.

Press Fit Spring Plungers can be used when a threaded Spring Plunger is impractical or when threaded adjustments are not required for detent.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

Light Pressure										
White Delrin® Nose										
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
10562	10586	0.50	1.0	.125	.252	.062	.070	.187	.032	1
10563	10587	0.75	2.0	.157	.330	.078	.093	.215	.035	1
10564	10588	0.75	2.5	.188	.405	.094	.121	.250	.035	1
10566	10590	1.5	3.0	.250	.481	.125	.168	.312	.044	1
10568	10592	2.0	5.0	.312	.643	.151	.186	.375	.045	1
10570	10594	2.5	7.0	.375	.785	.187	.234	.500	.078	2
10572	10596	4.0	9.0	.500	1.130	.250	.332	.688	.088	4

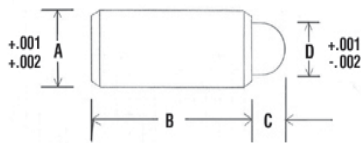
Light Pressure										
Heat Treated Steel Nose - Zinc Plated Finish / Stainless Nose										
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
10514	10538	0.50	1.0	.125	.252	.062	.070	.187	.032	1
10515	10539	0.75	2.0	.157	.330	.078	.093	.215	.035	1
10516	10540	0.75	2.5	.188	.405	.094	.121	.250	.035	1
10518	10542	1.5	3.0	.250	.481	.125	.168	.312	.044	1
10520	10544	2.0	5.0	.312	.643	.151	.186	.375	.045	1
10522	10546	2.5	7.0	.375	.785	.187	.234	.500	.078	2
10524	10548	4.0	9.0	.500	1.130	.250	.332	.688	.088	4

White End - Light Pressure Stainless

Ask for quoted price for 500 pieces or more of any one item.

The Press-Thru™ Spring Plunger has the same body dimensions, spring pressure and materials as the Press Fit Spring Plungers. It will not have the flange on the nose end. This will allow for insertion into the work piece from the top or bottom, front or back. Simply press the body so the plunger end is flush with the surface. Without the flange, these plungers may be used where less clearance is available. They are made oversized to secure firmly into the hole.

PATENT PENDING



Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

All stainless steel parts are made of 303 material.

A stainless steel part will withstand higher working temperatures.

Easy installation. Use in wood, soft plastic or aluminum applications.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

Press-Thru™ Spring Plungers

Heavy Pressure								
Heat Treated Steel Nose - Black Oxide Finish / Stainless Nose								
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	+.001 -.002 D	Net lbs Per 100
		Start	Full					
10701	10701-SS	1.0	2.0	.125	.284	.062	.070	1
10701A	10701A-SS	1.25	3.25	.157	.365	.078	.093	1
10702	10702-SS	1.5	4.5	.188	.440	.094	.121	1
10703	10703-SS	2.5	6.0	.250	.525	.125	.168	1
10704	10704-SS	4.0	10.0	.312	.688	.151	.186	1
10705	10705-SS	5.0	14.0	.375	.864	.187	.234	2
10706	10706-SS	8.0	18.0	.500	1.218	.250	.332	4

Heavy Pressure								
Brown Delrin® Nose								
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	+.001 -.002 D	Net lbs Per 100
		Start	Full					
10708	10708-SS	1.0	2.0	.125	.284	.062	.070	1
10708A	10708A-SS	1.25	3.25	.157	.365	.078	.093	1
10709	10709-SS	1.5	4.5	.188	.440	.094	.121	1
10710	10710-SS	2.5	6.0	.250	.525	.125	.168	1
10711	10711-SS	4.0	10.0	.312	.688	.151	.186	1
10712	10712-SS	5.0	14.0	.375	.864	.187	.234	2
10713	10713-SS	8.0	18.0	.500	1.218	.250	.332	4

Light Pressure								
Heat Treated Steel Nose - Zinc Finish / Stainless Nose								
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	+.001 -.002 D	Net lbs Per 100
		Start	Full					
10715	10715-SS	0.50	1.0	.125	.284	.062	.070	1
10715A	10715A-SS	0.75	2.0	.157	.365	.078	.093	1
10716	10716-SS	0.75	2.5	.188	.440	.094	.121	1
10717	10717-SS	1.5	3.0	.250	.525	.125	.168	1
10718	10718-SS	2.0	5.0	.312	.688	.151	.186	1
10719	10719-SS	2.5	7.0	.375	.864	.187	.234	2
10720	10720-SS	4.0	9.0	.500	1.218	.250	.332	4

Light Pressure								
White Delrin® Nose								
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	+.001 -.002 D	Net lbs Per 100
		Start	Full					
10722	10722-SS	0.50	1.0	.125	.284	.062	.070	1
10722A	10722A-SS	0.75	2.0	.157	.365	.078	.093	1
10723	10723-SS	0.75	2.5	.188	.440	.094	.121	1
10724	10724-SS	1.5	3.0	.250	.525	.125	.168	1
10725	10725-SS	2.0	5.0	.312	.688	.151	.186	1
10726	10726-SS	2.5	7.0	.375	.864	.187	.234	2
10727	10727-SS	4.0	9.0	.500	1.218	.250	.332	4

Ask for quoted price for 500 or more of any one item.

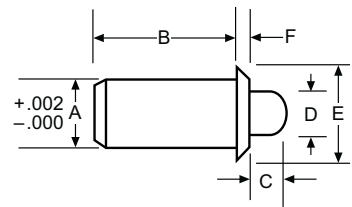
For more information, check out our website:

www.northwesternertools.com

NEW! Press Fit Spring Plungers With Extended Travel

Heat Treated Steel Nose - Black Oxide & Stainless Steel Nose									
Steel Part No.	Stainless Steel Part No.	End Pressures Pounds		A	B	C	D	E	F
		Start	Full						
10502EX	10526EX	0.5	1.25	.125	.252	.093	.070	.187	.032
10503EX	10527EX	0.75	1.5	.157	.330	.125	.093	.215	.035
10504EX	10528EX	1.25	3.0	.188	.405	.156	.121	.248	.035
10506EX	10530EX	1.5	6.0	.250	.481	.203	.168	.310	.044
10508EX	10532EX	1.75	8.0	.312	.643	.250	.188	.375	.045
10510EX	10534EX	2.0	9.0	.375	.785	.312	.234	.498	.078
10512EX	10536EX	5.9	21.0	.500	1.13	.375	.332	.685	.088

Steel Body and Stainless With Brown Delrin® Nose									
Steel Part No.	Stainless Steel Part No.	End Pressures Pounds		A	B	C	D	E	F
		Start	Full						
10550EX	10574EX	0.5	1.25	.125	.252	.093	.070	.187	.032
10551EX	10575EX	0.75	1.5	.157	.330	.125	.093	.215	.035
10552EX	10576EX	1.25	3.0	.188	.405	.156	.121	.248	.035
10554EX	10578EX	1.5	6.0	.250	.481	.203	.168	.310	.044
10556EX	10580EX	1.75	8.0	.312	.643	.250	.188	.375	.045
10558EX	10582EX	2.0	9.0	.375	.785	.312	.234	.498	.078
10560EX	10584EX	5.0	21.0	.500	1.13	.375	.332	.685	.088



Press Fit Spring Plungers can be used when a threaded Spring Plunger is impractical or when threaded adjustments are not required for detent.

Easy installation. Use in wood, soft plastic or aluminum applications.

Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

All stainless steel parts are made of 303 material.

A stainless steel part will withstand higher working temperatures.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

They are made oversized to secure firmly into the hole.

Not having a flange allows insertion into the work piece from the top or bottom

PATENT PENDING



NEW! Press-Thru™ Spring Plungers With Extended Travel

Heat Treated Steel Nose - Black Oxide & Stainless Steel Nose									
Steel Part No.	Stainless Steel Part No.	End Pressures Pounds		A	B	C	D	E	F
		Start	Full						
10701EX	10701SS-EX	0.5	1.25	.125	.284	.093	.070	.187	.032
10701AEX	10701ASS-EX	0.75	1.5	.157	.365	.125	.093	.215	.035
10702EX	10702SS-EX	1.25	3.0	.188	.440	.156	.121	.248	.035
10703EX	10703SS-EX	1.5	6.0	.250	.525	.203	.168	.310	.044
10704EX	10704SS-EX	1.75	8.0	.312	.688	.250	.188	.375	.045
10705EX	10705SS-EX	2.0	9.0	.375	.864	.312	.234	.498	.078
10706EX	10706SS-EX	5.0	21.0	.500	1.218	.375	.332	.685	.088

Steel Body and Stainless With Brown Delrin® Nose									
Steel Part No.	Stainless Steel Part No.	End Pressures Pounds		A	B	C	D	E	F
		Start	Full						
10708EX	10708SS-EX	0.5	1.25	.125	.284	.093	.070	.187	.032
10708AEX	10708ASS-EX	0.75	1.5	.157	.365	.125	.093	.215	.035
10709EX	10709SS-EX	1.25	3.0	.188	.440	.156	.121	.248	.035
10710EX	10710SS-EX	1.5	6.0	.250	.525	.203	.168	.310	.044
10711EX	10711SS-EX	1.75	8.0	.312	.688	.250	.188	.375	.045
10712EX	10712SS-EX	2.0	9.0	.375	.864	.312	.234	.498	.078
10713EX	10713SS-EX	5.0	21.0	.500	1.218	.375	.332	.685	.088

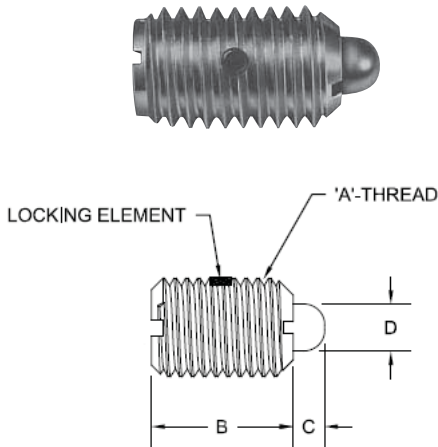
Ask for quoted price for 500 or more of any one item.

For more information, check out our website:

www.northwesternertools.com

NEW!

Metric Short Spring Plungers



Steel bodies are made of 12L14 material with a black oxide finish.

Steel noses are case hardened for wear resistance without brittleness.

All Dimensions in Millimeters

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in Newtons. Full pressures are the force Newtons needed to move the nose the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

Heavy Spring Pressures

Heat Treated Black Oxide Steel Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	+.000 -.050 D	Net lbs Per 100
		Start	Full					
33104M	33104MP	6.5	21.0	M4 x 0.7	11.0	1.32	1.77	1/2
33106M	33106MP	7.5	28.0	M5 x 0.8	12.0	1.65	2.36	1/2
33110M	33110MP	13.5	46.5	M6 x 1.0	13.5	1.98	3.02	1/2
33112M	33110MP	16.5	69.0	M8 x 1.25	14.0	2.14	3.42	1
33114M	33112MP	20.0	82.0	M10 x 1.5	16.0	2.80	4.72	2
33116M	33114MP	22.0	125.5	M12 x 1.75	19.0	3.83	6.29	3

Brown Delrin® Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	+.000 -.050 D	Net lbs Per 100
		Start	Full					
33002M	33002MP	6.5	21.0	M4 x 0.7	11.0	1.32	1.77	1/2
33004M	33004MP	7.5	28.0	M5 x 0.8	12.0	1.65	2.36	1/2
33006M	33006MP	13.5	46.5	M6 x 1.0	13.5	1.98	3.02	1/2
33008M	33008MP	16.5	69.0	M8 x 1.25	14.0	2.14	3.42	1
33010M	33010MP	20.0	82.0	M10 x 1.5	16.0	2.80	4.72	2
33012M	33012MP	22.0	125.5	M12 x 1.75	19.0	3.83	6.29	3

All parts conform to TCMAI Standards

Also available with extended travel noses.

NEW!

Light Pressures

Heat Treated Zinc Plated Steel Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	+.000 -.050 D	Net lbs Per 100
		Start	Full					
33203M	33203MP	2.0	6.5	M4 x 0.7	11.0	1.32	1.77	1/2
33205M	33205MP	3.5	11.0	M5 x 0.8	12.0	1.65	2.36	1/2
33208M	33208MP	4.5	15.5	M6 x 1.0	13.5	1.98	3.02	1/2
33210M	33210MP	6.5	18.0	M8 x 1.25	14.0	2.14	3.42	1
33212M	33212MP	6.5	22.0	M10 x 1.5	16.0	2.80	4.72	2
33214M	33214MP	8.0	24.5	M12 x 1.75	19.0	3.83	6.29	3

White Delrin® Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	+.000 -.050 D	Net lbs Per 100
		Start	Full					
33302M	33302MP	2.0	6.5	M4 x 0.7	11.0	1.32	1.77	1/2
33304M	33304MP	3.5	11.0	M5 x 0.8	12.0	1.65	2.36	1/2
33306M	33306MP	4.5	15.5	M6 x 1.0	13.5	1.98	3.02	1/2
33308M	33308MP	6.5	18.0	M8 x 1.25	14.0	2.14	3.42	1
33310M	33310MP	6.5	22.0	M10 x 1.5	16.0	2.80	4.72	2
33312M	33312MP	8.0	24.5	M12 x 1.75	19.0	3.83	6.29	3

All parts conform to TCMAI Standards

Ask for quoted price for 500 or more of any one item.

For more information, check out our website:

www.northwesterntools.com

Metric Spring Plungers

Standard Lengths (With Heavy Spring Pressures)

Heat Treated Black Oxide Steel Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33154	33154P	13.5	58.0	M6 x 1.0	25.00	5.00	3.00	1
33155	33155P	13.5	67.0	M8 x 1.25	25.00	5.00	3.40	2
33156	33156P	24.5	64.5	M10 x 1.5	29.00	5.00	4.70	4
33157	33157P	29.5	77.5	M12 x 1.75	32.00	6.00	6.30	5

Brown Delrin® Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33054	33054P	13.5	58.0	M6 x 1.0	25.00	5.00	3.00	1
33055	33055P	13.5	67.0	M8 x 1.25	25.00	5.00	3.40	2
33056	33056P	24.5	64.5	M10 x 1.5	29.00	5.00	4.70	4
33057	33057P	29.5	77.5	M12 x 1.75	32.00	6.00	6.30	5

Standard Lengths (With Light Spring Pressures)

Heat Treated Zinc Plated Steel Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33254	33254P	4.5	18.0	M6 x 1.0	25.00	5.00	3.00	1
33255	33255P	6.5	20.0	M8 x 1.25	25.00	5.00	3.40	2
33256	33256P	12.5	32.0	M10 x 1.5	29.00	5.00	4.70	4
33257	33257P	12.0	41.5	M12 x 1.75	32.00	6.00	6.30	5

White Delrin® Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33354	33354P	4.5	18.0	M6 x 1.0	25.00	5.00	3.00	1
33355	33355P	6.5	20.0	M8 x 1.25	25.00	5.00	3.40	2
33356	33356P	12.5	32.0	M10 x 1.5	29.00	5.00	4.70	4
33357	33357P	12.0	41.5	M12 x 1.75	32.00	6.00	6.30	5

**Standard Lengths (With Heavy Spring Pressures)
Stainless Steel Body**

Stainless Steel Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33154SS	33154P-SS	13.5	58.0	M6 x 1.0	25.00	5.00	3.00	1
33155SS	33155P-SS	13.5	67.0	M8 x 1.25	25.00	5.00	3.40	2
33156SS	33156P-SS	24.5	64.5	M10 x 1.5	29.00	5.00	4.70	4
33157SS	33157P-SS	29.5	77.5	M12 x 1.75	32.00	6.00	6.30	5

Brown Delrin® Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33054SS	33054P-SS	13.5	58.0	M6 x 1.0	25.00	5.00	3.00	1
33055SS	33055P-SS	13.5	67.0	M8 x 1.25	25.00	5.00	3.40	2
33056SS	33056P-SS	24.5	64.5	M10 x 1.5	29.00	5.00	4.70	4
33057SS	33057P-SS	29.5	77.5	M12 x 1.75	32.00	6.00	6.30	5

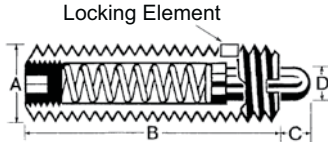
Standard Lengths (With Light Spring Pressures)

Stainless Steel Nose - Color Code: White Ends

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33254SS	33254P-SS	4.5	18.0	M6 x 1.0	25.00	5.00	3.00	1
33255SS	33255P-SS	6.5	20.0	M8 x 1.25	25.00	5.00	3.40	2
33256SS	33256P-SS	12.5	32.0	M10 x 1.5	29.00	5.00	4.70	4
33257SS	33257P-SS	12.0	41.5	M12 x 1.75	32.00	6.00	6.30	5

White Delrin® Nose

Part No.	Without Lock. Ele.	End Pressures Newtons		Class 6g ISO A	B	C	±.025 D	Net lbs Per 100
		Start	Full					
33354SS	33354P-SS	4.5	18.0	M6 x 1.0	25.00	5.00	3.00	1
33355SS	33355P-SS	6.5	20.0	M8 x 1.25	25.00	5.00	3.40	2
33356SS	33356P-SS	12.5	32.0	M10 x 1.5	29.00	5.00	4.70	4
33357SS	33357P-SS	12.0	41.5	M12 x 1.75	32.00	6.00	6.30	5



Steel bodies are made of 12L14 material with a black oxide finish.

All stainless steel parts are made of 303 material.

Steel noses are case hardened for wear resistance without brittleness.

Stainless steel parts are used for maximum protection against rust and corrosion.

All Dimensions in Millimeters

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

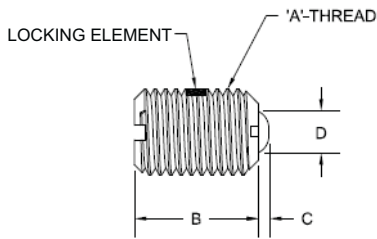
The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in Newtons. Full pressures are the force Newtons needed to move the nose the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

Ask for quoted price for 500 or more of any one item.

Ball Plungers



Steel bodies are made of 12L14 material with a black oxide finish.

Balls are 440 Stainless Steel.

Stainless bodies are made of 303 material.

Stainless steel parts are used for maximum protection against rust and corrosion.

6-40 and smaller have no slot in ball end.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the ball the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from Plunger end, Page 35.

Steel Ball Plungers (Stainless Ball)

Part No.	Without Lock. Ele.	**Color Code	End Press. - lbs		A	B	C	Ball Dia. D	Net lbs Per 100
			Start	Full					
10001B	10001BP	Plain	0.12	0.5	4-48	3/16	.020	.062	1/4
10002B	10002BP	Plain	0.25	0.75	5-40	1/4	.020	.062	1/4
10003B	10003BP	Plain	0.5	1.0	6-40	5/16	.023	.078	1/4
10004B	10004BP	Plain	0.5	1.25	8-36	11/32	.025	.093	1/4
10100B	10100BP	Plain	0.5	1.25	8-32	11/32	.025	.093	1/4
10005	10005P	Silver	0.5	1.5	10-32	33/64	.025	.093	1/4
10006	10006P	Black	1.5	3.0	10-32	33/64	.025	.093	1/4
10007	10007P	Gold	2.0	5.0	10-32	33/64	.025	.093	1/4
10008	10008P	Silver	2.0	4.0	1/4-20	17/32	.035	.125	1/2
10009	10009P	Black	3.0	7.0	1/4-20	17/32	.035	.125	1/2
10010	10010P	Gold	4.0	12.0	1/4-20	17/32	.035	.125	1/2
10011	10011P	Silver	2.0	4.5	5/16-18	37/64	.040	.156	1
10012	10012P	Black	4.0	9.0	5/16-18	37/64	.040	.156	1
10013	10013P	Gold	6.0	17.0	5/16-18	37/64	.040	.156	1
10014	10014P	Silver	2.5	5.0	3/8-16	5/8	.048	.187	1-1/2
10015	10015P	Black	5.0	10.0	3/8-16	5/8	.048	.187	1-1/2
10016	10016P	Gold	6.0	21.0	3/8-16	5/8	.048	.187	1-1/2
10017	10017P	Silver	3.0	6.0	1/2-13	3/4	.072	.281	3
10018	10018P	Black	6.0	12.0	1/2-13	3/4	.072	.281	3
10019	10019P	Gold	6.0	30.0	1/2-13	3/4	.072	.281	3
10020	10020P	Silver	4.5	9.0	5/8-11	63/64	.096	.375	5-1/2
10021	10021P	Black	9.0	18.0	5/8-11	63/64	.096	.375	5-1/2
10022	10022P	Gold	7.0	50.0	5/8-11	63/64	.096	.375	5-1/2

**Silver - Light Pressures

Black - Medium Pressures

Gold - Heavy Pressures

All Parts Conform to TCMAI Standards

Stainless "P" Plungers are not color coded.

Stainless Steel Ball Plungers (Stainless Ball)

Part No.	Without Lock. Ele.	**Color Code	End Press. - lbs		A	B	C	Ball Dia. D	Net lbs Per 100
			Start	Full					
10001	10001P	Plain	0.12	0.5	4-48	3/16	.020	.062	1/4
10002	10002P	Plain	0.25	0.75	5-40	1/4	.020	.062	1/4
10003	10003P	Plain	0.5	1.0	6-40	5/16	.023	.078	1/4
10004	10004P	Plain	0.5	1.25	8-36	11/32	.025	.093	1/4
10100	10100P	Plain	0.5	1.25	8-32	11/32	.025	.093	1/4
10101	10101P	Plain	0.5	1.5	10-32	33/64	.025	.093	1/4
10102	10102P	Black	1.5	3.0	10-32	33/64	.025	.093	1/4
10103	10103P	Yellow	2.0	5.0	10-32	33/64	.025	.093	1/4
10104	10104P	Plain	2.0	4.0	1/4-20	17/32	.035	.125	1/2
10105	10105P	Black	3.0	7.0	1/4-20	17/32	.035	.125	1/2
10106	10106P	Yellow	4.0	12.0	1/4-20	17/32	.035	.125	1/2
10107	10107P	Plain	2.0	4.5	5/16-18	37/64	.040	.156	1
10108	10108P	Black	4.0	9.0	5/16-18	37/64	.040	.156	1
10109	10109P	Yellow	6.0	17.0	5/16-18	37/64	.040	.156	1
10110	10110P	Plain	2.5	5.0	3/8-16	5/8	.048	.187	1-1/4
10111	10111P	Black	5.0	10.0	3/8-16	5/8	.048	.187	1-1/4
10112	10112P	Yellow	6.0	21.0	3/8-16	5/8	.048	.187	1-1/4
10113	10113P	Plain	3.0	6.0	1/2-13	3/4	.072	.281	3
10114	10114P	Black	6.0	12.0	1/2-13	3/4	.072	.281	3
10115	10115P	Yellow	6.0	30.0	1/2-13	3/4	.072	.281	3
10116	10116P	Plain	4.5	9.0	5/8-11	63/64	.096	.375	5-1/2
10117	10117P	Black	9.0	18.0	5/8-11	63/64	.096	.375	5-1/2
10118	10118P	Yellow	7.0	50.0	5/8-11	63/64	.096	.375	5-1/2

**Plain Ends - Light Pressures

Black Ends - Medium Pressures

Yellow Ends - Heavy Pressures

All Parts Conform to TCMAI Standards

**For more information,
check out our website:**

www.northwesterntools.com

Ball Plungers

Steel Ball Plungers (Delrin® Ball)

Part No.	Without Lock. Ele.	**Color Code	End Press. - lbs		A	B	C	Ball Dia. D
			Start	Full				
10250	10250P	Plain	0.12	0.5	4-48	3/16	.020	.062
10251	10251P	Plain	0.25	0.75	5-40	1/4	.020	.062
10252	10252P	Plain	0.5	1.0	6-40	5/16	.023	.078
10253	10253P	Plain	0.5	1.25	8-36	11/32	.025	.093
10254	10254P	Plain	0.5	1.25	8-32	11/32	.025	.093
10255	10255P	Silver	0.5	1.5	10-32	33/64	.025	.093
10256	10256P	Black	1.5	3.0	10-32	33/64	.025	.093
10257	10257P	Gold	2.0	5.0	10-32	33/64	.025	.093
10258	10258P	Silver	2.0	4.0	1/4-20	17/32	.035	.125
10259	10259P	Black	3.0	7.0	1/4-20	17/32	.035	.125
10260	10260P	Gold	4.0	12.0	1/4-20	17/32	.035	.125
10261	10261P	Silver	2.0	4.5	5/16-18	37/64	.040	.156
10262	10262P	Black	4.0	9.0	5/16-18	37/64	.040	.156
10263	10263P	Gold	6.0	17.0	5/16-18	37/64	.040	.156
10264	10264P	Silver	2.5	5.0	3/8-16	5/8	.048	.187
10265	10265P	Black	5.0	10.0	3/8-16	5/8	.048	.187
10266	10266P	Gold	6.0	21.0	3/8-16	5/8	.048	.187
10267	10267P	Silver	3.0	6.0	1/2-13	3/4	.072	.281
10268	10268P	Black	6.0	12.0	1/2-13	3/4	.072	.281
10269	10269P	Gold	6.0	30.0	1/2-13	3/4	.072	.281
10270	10270P	Silver	4.5	9.0	5/8-11	63/64	.096	.375
10271	10271P	Black	9.0	18.0	5/8-11	63/64	.096	.375
10272	10272P	Gold	7.0	50.0	5/8-11	63/64	.096	.375

**Silver - Light Pressures

Black - Medium Pressures

Gold - Heavy Pressures

All Parts Conform to TCMAI Standards

Stainless "P" Plungers are not color coded.

Stainless Steel Ball Plungers (Delrin® Ball)

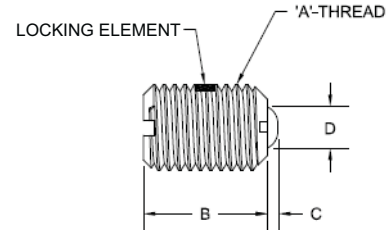
Part No.	Without Lock. Ele.	**Color Code	End Press. - lbs		A	B	C	Ball Dia. D
			Start	Full				
10150	10150P	Plain	0.12	0.5	4-48	3/16	.020	.062
10151	10151P	Plain	0.25	0.75	5-40	1/4	.020	.062
10152	10152P	Plain	0.5	1.0	6-40	5/16	.023	.078
10153	10153P	Plain	0.5	1.25	8-36	11/32	.025	.093
10154	10154P	Plain	0.5	1.25	8-32	11/32	.025	.093
10155	10155P	Plain	0.5	1.5	10-32	33/64	.025	.093
10156	10156P	Black	1.5	3.0	10-32	33/64	.025	.093
10157	10157P	Yellow	2.0	5.0	10-32	33/64	.025	.093
10158	10158P	Plain	2.0	4.0	1/4-20	17/32	.035	.125
10159	10159P	Black	3.0	7.0	1/4-20	17/32	.035	.125
10160	10160P	Yellow	4.0	12.0	1/4-20	17/32	.035	.125
10161	10161P	Plain	2.0	4.5	5/16-18	37/64	.040	.156
10162	10162P	Black	4.0	9.0	5/16-18	37/64	.040	.156
10163	10163P	Yellow	6.0	17.0	5/16-18	37/64	.040	.156
10164	10164P	Plain	2.5	5.0	3/8-16	5/8	.048	.187
10165	10165P	Black	5.0	10.0	3/8-16	5/8	.048	.187
10166	10166P	Yellow	6.0	21.0	3/8-16	5/8	.048	.187
10167	10167P	Plain	3.0	6.0	1/2-13	3/4	.072	.281
10168	10168P	Black	6.0	12.0	1/2-13	3/4	.072	.281
10169	10169P	Yellow	6.0	30.0	1/2-13	3/4	.072	.281
10170	10170P	Plain	4.5	9.0	5/8-11	63/64	.096	.375
10171	10171P	Black	9.0	18.0	5/8-11	63/64	.096	.375
10172	10172P	Yellow	7.0	50.0	5/8-11	63/64	.096	.375

**Plain Ends - Light Pressures

Black Ends - Medium Pressures

Yellow Ends - Heavy Pressures

All Parts Conform to TCMAI Standards



Steel bodies are made of 12L14 material with a black oxide finish.

Balls are 440 Stainless Steel.

Stainless bodies are made of 303 material.

Stainless steel parts are used for maximum protection against rust and corrosion.

6-40 and smaller have no slot in ball end.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

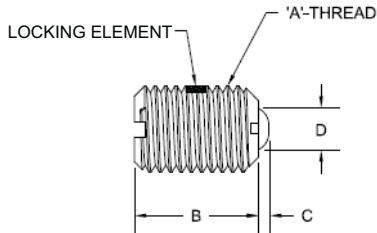
End pressures are given in pounds. Full pressures are the force pounds needed to move the ball the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from Plunger end, Page 35.

**For more information,
check out our website:**

www.northwesterntools.com

Metric Ball Plungers



Steel bodies are made of 12L14 material with a black oxide finish.

Steel bodies are zinc plated.

Balls are 440 stainless.

Stainless bodies are 303 material.

Stainless steel parts are used for maximum protection against rust and corrosion.

All Dimensions in Millimeters

The M3 body will not have a slot on the ball end.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and can not be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in Newtons. Full pressures are the force Newtons needed to move the ball the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

**For more information,
check out our website:
www.northwesterntools.com**

Steel and Stainless Steel Ball Plungers (Stainless Ball)

Steel Part No.	Stainless Steel Part No.	**Color Code	End Pressure Newtons		Class 6g ISO			Ball Dia. D	Net lbs Per 100
			Start	Full	A	B	C		
10052	10052-SS	Plain	0.53	2.2	M3 x 0.5	4.7	0.51	1.57	1/4
10053	10053-SS	Plain	2.2	5.6	M4 x 0.7	8.7	0.60	2.36	1/4
10054	10054-SS	White	2.2	6.7	M5 x 0.8	13.0	0.60	2.36	1/4
10055	10055-SS	Green	6.7	13.3	M5 x 0.8	13.0	0.60	2.36	1/4
10056	10056-SS	Yellow	8.9	22.2	M5 x 0.8	13.0	0.60	2.36	1/4
10057	10057-SS	White	8.9	17.8	M6 x 1.0	13.5	0.90	3.17	1/2
10058	10058-SS	Green	13.3	31.1	M6 x 1.0	13.5	0.90	3.17	1/2
10059	10059-SS	Yellow	17.8	53.3	M6 x 1.0	13.5	0.90	3.17	1/2
10060	10060-SS	White	8.9	20.0	M8 x 1.25	14.7	1.00	3.96	1
10061	10061-SS	Green	17.8	40.0	M8 x 1.25	14.7	1.00	3.96	1
10062	10062-SS	Yellow	26.7	75.6	M8 x 1.25	14.7	1.00	3.96	1
10063	10063-SS	White	11.1	22.2	M10 x 1.5	15.9	1.20	4.75	1-1/2
10064	10064-SS	Green	22.2	44.5	M10 x 1.5	15.9	1.20	4.75	1-1/2
10065	10065-SS	Yellow	26.7	93.4	M10 x 1.5	15.9	1.20	4.75	1-1/2
10066	10066-SS	White	13.3	26.7	M12 x 1.75	19.0	2.00	7.14	3
10067	10067-SS	Green	26.7	53.4	M12 x 1.75	19.0	2.00	7.14	3
10068	10068-SS	Yellow	26.7	133.4	M12 x 1.75	19.0	2.00	7.14	3
10069	10069-SS	White	20.0	40.0	M16 x 2.0	25.0	2.50	9.52	5-1/2
10070	10070-SS	Green	40.0	80.0	M16 x 2.0	25.0	2.50	9.52	5-1/2
10071	10071-SS	Yellow	31.1	222.4	M16 x 2.0	25.0	2.50	9.52	5-1/2

**White Ends - Light Pressures Green Ends - Medium Pressures Yellow Ends - Heavy Pressures

To order Metric Ball Plungers without locking element add "P" to the Part Number.

EX. 10067 has locking element
10067P has NO locking element

Stainless "P" Plungers are not color coded.

Steel and Stainless Steel Ball Plungers (Delrin® Ball)

Steel Part No.	Stainless Steel Part No.	**Color Code	End Pressure Newtons		Class 6g ISO			Ball Dia. D	Net lbs Per 100
			Start	Full	A	B	C		
10352	10352-SS	Plain	0.53	2.2	M3 x 0.5	4.7	0.51	1.57	1/4
10353	10353-SS	Plain	2.2	5.6	M4 x 0.7	8.7	0.60	2.36	1/4
10354	10354-SS	White	2.2	6.7	M5 x 0.8	13.0	0.60	2.36	1/4
10355	10355-SS	Green	6.7	13.3	M5 x 0.8	13.0	0.60	2.36	1/4
10356	10356-SS	Yellow	8.9	22.2	M5 x 0.8	13.0	0.60	2.36	1/4
10357	10357-SS	White	8.9	17.8	M6 x 1.0	13.5	0.90	3.17	1/2
10358	10358-SS	Green	13.3	31.1	M6 x 1.0	13.5	0.90	3.17	1/2
10359	10359-SS	Yellow	17.8	53.3	M6 x 1.0	13.5	0.90	3.17	1/2
10360	10360-SS	White	8.9	20.0	M8 x 1.25	14.7	1.00	3.96	1
10361	10361-SS	Green	17.8	40.0	M8 x 1.25	14.7	1.00	3.96	1
10362	10362-SS	Yellow	26.7	75.6	M8 x 1.25	14.7	1.00	3.96	1
10363	10363-SS	White	11.1	22.2	M10 x 1.5	15.9	1.20	4.75	1-1/2
10364	10364-SS	Green	22.2	44.5	M10 x 1.5	15.9	1.20	4.75	1-1/2
10365	10365-SS	Yellow	26.7	93.4	M10 x 1.5	15.9	1.20	4.75	1-1/2
10366	10366-SS	White	13.3	26.7	M12 x 1.75	19.0	2.00	7.14	3
10367	10367-SS	Green	26.7	53.4	M12 x 1.75	19.0	2.00	7.14	3
10368	10368-SS	Yellow	26.7	133.4	M12 x 1.75	19.0	2.00	7.14	3
10369	10369-SS	White	20.0	40.0	M16 x 2.0	25.0	2.50	9.52	5-1/2
10370	10370-SS	Green	40.0	80.0	M16 x 2.0	25.0	2.50	9.52	5-1/2
10371	10371-SS	Yellow	31.1	222.4	M16 x 2.0	25.0	2.50	9.52	5-1/2

**White Ends - Light Pressures Green Ends - Medium Pressures Yellow Ends - Heavy Pressures

Press Fit Ball Plungers

Press Fit Ball Plungers can be used when a threaded ball plunger is impractical or when threaded adjustments are not required for detent. Easy installation for use in wood, soft plastic or aluminum.

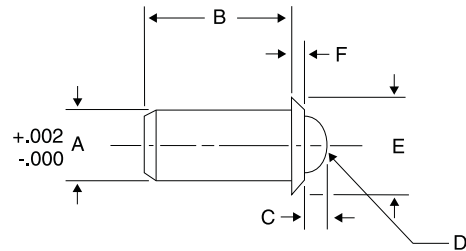
Available in seven popular body diameters with three convenient spring pressures.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

Steel bodies are made of 12L14 material with a black oxide finish.

Stainless bodies are made of 303 material.

Balls are 440 stainless.



Stainless Ball

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	Ball Dia. D	E	F
		Start	Full						
10410	10430	0.5	1.0	.125	.252	.035	.093	.187	.032
10410A	10430A	0.75	2.0	.157	.330	.046	.125	.215	.035
10411	10431	1.0	2.5	.188	.405	.058	.156	.250	.035
10412	10432	1.5	3.5	.250	.481	.070	.187	.312	.044
10412A	10432A	2.0	5.0	.312	.643	.090	.250	.375	.045
10413	10433	2.5	7.0	.375	.785	.110	.312	.500	.078
10414	10434	4.0	9.0	.500	1.130	.161	.437	.688	.088

Delrin® Ball

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	Ball Dia. D	E	F	Net lbs Per 100
		Start	Full							
10450	10470	0.5	1.0	.125	.252	.035	.093	.187	.032	1/4
10450A	10470A	0.75	2.0	.157	.330	.046	.125	.215	.035	1/4
10451	10471	1.0	2.5	.188	.405	.058	.156	.250	.035	1/4
10452	10472	1.5	3.5	.250	.481	.070	.187	.312	.044	1/2
10452A	10472A	2.0	5.0	.312	.643	.090	.250	.375	.045	1
10453	10473	2.5	7.0	.375	.785	.110	.312	.500	.078	2
10454	10474	4.0	9.0	.500	1.130	.161	.437	.688	.088	4

White Ends - Light Pressure

Stainless Ball

Medium Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	Ball Dia. D	E	F
		Start	Full						
10400	10420	0.75	2.5	.125	.252	.035	.093	.187	.032
10400A	10420A	1.5	3.5	.157	.330	.046	.125	.215	.035
10401	10421	2.0	5.0	.188	.405	.058	.156	.250	.035
10402	10422	3.0	7.0	.250	.481	.070	.187	.312	.044
10402A	10422A	4.0	10.0	.312	.643	.090	.250	.375	.045
10403	10423	5.0	14.0	.375	.785	.110	.312	.500	.078
10404	10424	8.0	18.0	.500	1.130	.161	.437	.688	.088

Delrin® Ball

Medium Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	Ball Dia. D	E	F	Net lbs Per 100
		Start	Full							
10440	10460	0.75	2.5	.125	.252	.035	.093	.187	.032	1/4
10440A	10460A	1.5	3.5	.157	.330	.046	.125	.215	.035	1/4
10441	10461	2.0	5.0	.188	.405	.058	.156	.250	.035	1/4
10442	10462	3.0	7.0	.250	.481	.070	.187	.312	.044	1/2
10442A	10462A	4.0	10.0	.312	.643	.090	.250	.375	.045	1
10443	10463	5.0	14.0	.375	.785	.110	.312	.500	.078	2
10444	10464	8.0	18.0	.500	1.130	.161	.437	.688	.088	4

Stainless Ball

Heavy Pressure

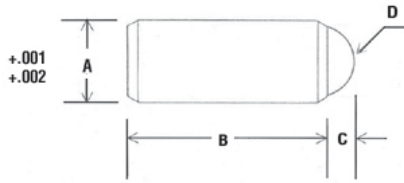
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	Ball Dia. D	E	F
		Start	Full						
10405	10425	2.0	5.0	.125	.252	.035	.093	.187	.032
10405A	10425A	3.0	7.5	.157	.330	.046	.125	.215	.035
10406	10426	4.0	10.0	.188	.405	.058	.156	.250	.035
10407	10427	6.0	13.0	.250	.481	.070	.187	.312	.044
10407A	10427A	8.0	16.0	.312	.643	.090	.250	.375	.045
10408	10428	10.0	18.0	.375	.785	.110	.312	.500	.078
10409	10429	12.0	23.0	.500	1.130	.161	.437	.688	.088

Delrin® Ball

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	Ball Dia. D	E	F	Net lbs Per 100
		Start	Full							
10445	10465	2.0	5.0	.125	.252	.035	.093	.187	.032	1/4
10445A	10465A	3.0	7.5	.157	.330	.046	.125	.215	.035	1/4
10446	10466	4.0	10.0	.188	.405	.058	.156	.250	.035	1/4
10447	10467	6.0	13.0	.250	.481	.070	.187	.312	.044	1/2
10447A	10467A	8.0	16.0	.312	.643	.090	.250	.375	.045	1
10448	10468	10.0	18.0	.375	.785	.110	.312	.500	.078	2
10449	10469	12.0	23.0	.500	1.130	.161	.437	.688	.088	4

Yellow Ends - Heavy Pressure



Press-Thru™ Ball Plungers

The Press-Thru™ Ball Plunger has the same body dimensions, spring pressure and materials as the Press Fit Ball Plungers. It will not have the flange on the ball end. This will allow for insertion into the work piece from the top or bottom, front or back. Simply press the body so the plunger end is flush with the surface. Without the flange, these plungers may be used where less clearance is available. They are made oversized to secure firmly into the hole.

Easy installation. Use in wood, soft plastic or aluminum applications.

Steel bodies are made of 12L14 material with a black oxide finish.

Stainless bodies are made of 303 material.

Balls are 440 stainless.

Delrin® balls prevent marring of aluminum, brass or other soft materials.

PATENT PENDING

Stainless Ball

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	Ball Dia. D
		Start	Full				
10600	10600-SS	0.5	1.0	.125	.284	.035	.093
10600A	10600A-SS	0.75	2.0	.157	.365	.046	.125
10601	10601-SS	1.0	2.5	.188	.440	.058	.156
10602	10602-SS	1.5	3.5	.250	.525	.070	.187
10603	10603-SS	2.0	5.0	.312	.688	.090	.250
10604	10604-SS	2.5	7.0	.375	.864	.110	.312
10605	10605-SS	4.0	9.0	.500	1.218	.161	.437

Delrin® Ball

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	Ball Dia. D	Net lbs Per 100
		Start	Full					
10621	10621-SS	0.5	1.0	.125	.284	.035	.093	1/4
10621A	10621A-SS	0.75	2.0	.157	.365	.046	.125	1/4
10622	10622-SS	1.0	2.5	.188	.440	.058	.156	1/4
10623	10623-SS	1.5	3.5	.250	.525	.070	.187	1/2
10624	10624-SS	2.0	5.0	.312	.688	.090	.250	1
10625	10625-SS	2.5	7.0	.375	.864	.110	.312	2
10626	10626-SS	4.0	9.0	.500	1.218	.161	.437	4

White Ends - Light Pressure

Stainless Ball

Medium Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	Ball Dia. D
		Start	Full				
10607	10607-SS	0.75	2.5	.125	.284	.035	.093
10607A	10607A-SS	1.5	3.5	.157	.365	.046	.125
10608	10608-SS	2.0	5.0	.188	.440	.058	.156
10609	10609-SS	3.0	7.0	.250	.525	.070	.187
10610	10610-SS	4.0	10.0	.312	.688	.090	.250
10611	10611-SS	5.0	14.0	.375	.864	.110	.312
10612	10612-SS	8.0	18.0	.500	1.218	.161	.437

Delrin® Ball

Medium Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	Ball Dia. D	Net lbs Per 100
		Start	Full					
10628	10628-SS	0.75	2.5	.125	.284	.035	.093	1/4
10628A	10628A-SS	1.5	3.5	.157	.365	.046	.125	1/4
10629	10629-SS	2.0	5.0	.188	.440	.058	.156	1/4
10630	10630-SS	3.0	7.0	.250	.525	.070	.187	1/2
10631	10631-SS	4.0	10.0	.312	.688	.090	.250	1
10632	10632-SS	5.0	14.0	.375	.864	.110	.312	2
10633	10633-SS	8.0	18.0	.500	1.218	.161	.437	4

Stainless Ball

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	Ball Dia. D
		Start	Full				
10614	10614-SS	2.0	5.0	.125	.284	.035	.093
10614A	10614A-SS	3.0	7.5	.157	.365	.046	.125
10615	10615-SS	4.0	10.0	.188	.440	.058	.156
10616	10616-SS	6.0	13.0	.250	.525	.070	.187
10617	10617-SS	8.0	16.0	.312	.688	.090	.250
10618	10618-SS	10.0	18.0	.375	.864	.110	.312
10619	10619-SS	12.0	23.0	.500	1.218	.161	.437

Delrin® Ball

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		+.001 +.002 A	B	C	Ball Dia. D	Net lbs Per 100
		Start	Full					
10635	10635-SS	2.0	5.0	.125	.284	.035	.093	1/4
10635A	10635A-SS	3.0	7.5	.157	.365	.046	.125	1/4
10636	10636-SS	4.0	10.0	.188	.440	.058	.156	1/4
10637	10637-SS	6.0	13.0	.250	.525	.070	.187	1/2
10638	10638-SS	8.0	16.0	.312	.688	.090	.250	1
10639	10639-SS	10.0	18.0	.375	.864	.110	.312	2
10640	10640-SS	12.0	23.0	.500	1.218	.161	.437	4

Yellow Ends - Heavy Pressure

NEW!

Hex Drive Steel Ball Plungers

Stainless Steel Ball

Part No.	Without Lock Ele.	**Color Code	End Pressure Pounds		A	B	C	Ball Dia. D	Hex Dia. E	Net lbs Per 100
			Start	Full						
10005H	10005HP	Silver	0.5	1.5	10-32	9/16	.025	.093	5/64	1/2
10006H	10006HP	Black	1.5	3.0	10-32	9/16	.025	.093	5/64	1/2
10007H	10007HP	Gold	2.0	5.0	10-32	9/16	.025	.093	5/64	1/2
10008H	10008HP	Silver	2.0	4.0	1/4-20	43/64	.035	.125	5/64	3/4
10009H	10009HP	Black	3.0	7.0	1/4-20	43/64	.035	.125	5/64	3/4
10010H	10010HP	Gold	4.0	12.0	1/4-20	43/64	.035	.125	5/64	3/4
10011H	10011HP	Silver	2.0	4.5	5/16-18	23/32	.040	.156	3/32	1
10012H	10012HP	Black	4.0	9.0	5/16-18	23/32	.040	.156	3/32	1
10013H	10013HP	Gold	6.0	17.0	5/16-18	23/32	.040	.156	3/32	1
10014H	10014HP	Silver	2.5	5.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10015H	10015HP	Black	5.0	10.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10016H	10016HP	Gold	6.0	21.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10017H	10017HP	Silver	3.0	6.0	1/2-13	1-3/64	.072	.281	7/32	4
10018H	10018HP	Black	6.0	12.0	1/2-13	1-3/64	.072	.281	7/32	4
10019H	10019HP	Gold	6.0	30.0	1/2-13	1-3/64	.072	.281	7/32	4
10020H	10020HP	Silver	4.5	9.0	5/8-11	1-15/64	.096	.375	1/4	6-1/2
10021H	10021HP	Black	9.0	18.0	5/8-11	1-15/64	.096	.375	1/4	6-1/2
10022H	10022HP	Gold	7.0	50.0	5/8-11	1-15/64	.096	.375	1/4	6-1/2

**Silver - Light Pressures

Black - Medium Pressures

Gold - Heavy Pressures

Steel bodies are made of 12L14 material with a black oxide finish.

Balls are 440 stainless.

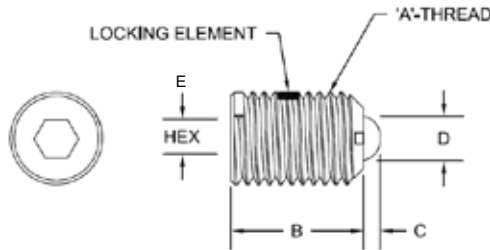
Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

All stainless bodies are made of 303 material.



NEW!

Hex Drive Stainless Steel Ball Plungers

Stainless Steel Ball

Part No.	Without Lock. Ele.	**Color Code	End Pressure Pounds		A	B	C	Ball Dia. D	Hex Dia. E	Net lbs Per 100
			Start	Full						
10101H	10101HP	Plain	0.5	1.5	10-32	9/16	.025	.093	5/64	1/2
10102H	10102HP	Black	1.5	3.0	10-32	9/16	.025	.093	5/64	1/2
10103H	10103HP	Yellow	2.0	5.0	10-32	9/16	.025	.093	5/64	1/2
10104H	10104HP	Plain	2.0	4.0	1/4-20	43/64	.035	.125	5/64	3/4
10105H	10105HP	Black	3.0	7.0	1/4-20	43/64	.035	.125	5/64	3/4
10106H	10106HP	Yellow	4.0	12.0	1/4-20	43/64	.035	.125	5/64	3/4
10107H	10107HP	Plain	2.0	4.5	5/16-18	23/32	.040	.156	3/32	1
10108H	10108HP	Black	4.0	9.0	5/16-18	23/32	.040	.156	3/32	1
10109H	10109HP	Yellow	6.0	17.0	5/16-18	23/32	.040	.156	3/32	1
10110H	10110HP	Plain	2.5	5.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10111H	10111HP	Black	5.0	10.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10112H	10112HP	Yellow	6.0	21.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10113H	10113HP	Plain	3.0	6.0	1/2-13	1-3/64	.072	.281	7/32	4
10114H	10114HP	Black	6.0	12.0	1/2-13	1-3/64	.072	.281	7/32	4
10115H	10115HP	Yellow	6.0	30.0	1/2-13	1-3/64	.072	.281	7/32	4
10116H	10116HP	Plain	4.5	9.0	5/8-11	1-15/64	.096	.375	1/4	6-1/2
10117H	10117HP	Black	9.0	18.0	5/8-11	1-15/64	.096	.375	1/4	6-1/2
10118H	10118HP	Yellow	7.0	50.0	5/8-11	1-15/64	.096	.375	1/4	6-1/2

**Silver - Light Pressures

Black - Medium Pressures

Gold - Heavy Pressures

Spring & Ball Plungers

Hex Drive Steel Ball Plungers

Steel bodies are made of 12L14 material with a black oxide finish.

Delrin® balls prevent marring of aluminum, brass or other soft materials.

Hex Drive Plungers use a positive drive for insertion and removal.

Plungers may be ordered with or without the locking element. Plungers without element are the same price, but are considered "specials" and cannot be returned. We recommend using without the locking element for applications in aluminum.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

To prevent possible spring damage, use of a Northwestern Wrench is recommended when installing from plunger end. See Page 35.

All stainless parts are made of 303 material.

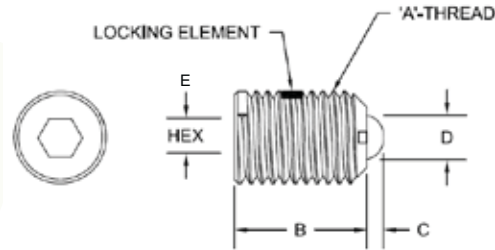
Delrin® Ball

Part No.	Without Lock. Ele.	**Color Code	End Pressure Pounds		A	B	C	Ball Dia. D	Hex Dia. E	Net lbs Per 100
			Start	Full						
10255H	10255HP	Silver	0.5	1.5	10-32	9/16	.025	.093	5/64	1/2
10256H	10256HP	Black	1.5	3.0	10-32	9/16	.025	.093	5/64	1/2
10257H	10257HP	Gold	2.0	5.0	10-32	9/16	.025	.093	5/64	1/2
10258H	10258HP	Silver	2.0	4.0	1/4-20	43/64	.035	.125	5/64	3/4
10259H	10259HP	Black	3.0	7.0	1/4-20	43/64	.035	.125	5/64	3/4
10260H	10260HP	Gold	4.0	12.0	1/4-20	43/64	.035	.125	5/64	3/4
10261H	10261HP	Silver	2.0	4.5	5/16-18	23/32	.040	.156	3/32	1
10262H	10262HP	Black	4.0	9.0	5/16-18	23/32	.040	.156	3/32	1
10263H	10263HP	Gold	6.0	17.0	5/16-18	23/32	.040	.156	3/32	1
10264H	10264HP	Silver	2.5	5.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10265H	10265HP	Black	5.0	10.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10266H	10266HP	Gold	6.0	21.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10267H	10267HP	Silver	3.0	6.0	1/2-13	1-3/64	.072	.281	7/32	3-1/2
10268H	10268HP	Black	6.0	12.0	1/2-13	1-3/64	.072	.281	7/32	3-1/2
10269H	10269HP	Gold	6.0	30.0	1/2-13	1-3/64	.072	.281	7/32	3-1/2
10270H	10270HP	Silver	4.5	9.0	5/8-11	1-15/64	.096	.375	1/4	6
10271H	10271HP	Black	9.0	18.0	5/8-11	1-15/64	.096	.375	1/4	6
10272H	10272HP	Gold	7.0	50.0	5/8-11	1-15/64	.096	.375	1/4	6

**Silver - Light Pressures

Black - Medium Pressures

Gold - Heavy Pressures



Hex Drive Stainless Steel Ball Plungers

Delrin® Ball

Part No.	Without Lock. Ele.	**Color Code	End Pressure Pounds		A	B	C	Ball Dia. D	Hex Dia. E	Net lbs Per 100
			Start	Full						
10155H	10155HP	Plain	0.5	1.5	10-32	9/16	.025	.093	5/64	1/2
10156H	10156HP	Black	1.5	3.0	10-32	9/16	.025	.093	5/64	1/2
10157H	10157HP	Yellow	2.0	5.0	10-32	9/16	.025	.093	5/64	1/2
10158H	10158HP	Plain	2.0	4.0	1/4-20	43/64	.035	.125	5/64	3/4
10159H	10159HP	Black	3.0	7.0	1/4-20	43/64	.035	.125	5/64	3/4
10160H	10160HP	Yellow	4.0	12.0	1/4-20	43/64	.035	.125	5/64	3/4
10161H	10161HP	Plain	2.0	4.5	5/16-18	23/32	.040	.156	3/32	1
10162H	10162HP	Black	4.0	9.0	5/16-18	23/32	.040	.156	3/32	1
10163H	10163HP	Yellow	6.0	17.0	5/16-18	23/32	.040	.156	3/32	1
10164H	10164HP	Plain	2.5	5.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10165H	10165HP	Black	5.0	10.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10166H	10166HP	Yellow	6.0	21.0	3/8-16	13/16	.048	.187	5/32	1-1/2
10167H	10167HP	Plain	3.0	6.0	1/2-13	1-3/64	.072	.281	7/32	3-1/2
10168H	10168HP	Black	6.0	12.0	1/2-13	1-3/64	.072	.281	7/32	3-1/2
10169H	10169HP	Yellow	6.0	30.0	1/2-13	1-3/64	.072	.281	7/32	3-1/2
10170H	10170HP	Plain	4.5	9.0	5/8-11	1-15/64	.096	.375	1/4	6
10171H	10171HP	Black	9.0	18.0	5/8-11	1-15/64	.096	.375	1/4	6
10172H	10172HP	Yellow	7.0	50.0	5/8-11	1-15/64	.096	.375	1/4	6

**Plain Ends - Light Pressures

Black Ends - Medium Pressures

Yellow Ends - Heavy Pressures

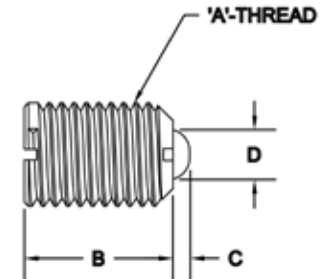
Delrin® Body Ball Plungers Stainless Ball

Part No.	Body Color	End Pressure Pounds		A	B	C	Ball Dia. D	Net lbs Per 100
		Start	Full					
10008-D	White	2.0	4.0	1/4-20	17/32	.035	.125	1/4
10009-D	Black	3.0	7.0	1/4-20	17/32	.035	.125	1/4
10010-D	Gold	4.0	12.0	1/4-20	17/32	.035	.125	1/4
10011-D	White	2.0	4.5	5/16-18	37/64	.040	.156	1/4
10012-D	Black	4.0	9.0	5/16-18	37/64	.040	.156	1/4
10013-D	Gold	6.0	17.0	5/16-18	37/64	.040	.156	1/4
10014-D	White	2.5	5.0	3/8-16	5/8	.048	.187	1/2
10015-D	Black	5.0	10.0	3/8-16	5/8	.048	.187	1/2
10016-D	Gold	6.0	21.0	3/8-16	5/8	.048	.187	1/2

White - Light Pressures

Black - Medium Pressures

Gold - Heavy Pressures



Delrin® Body Ball Plungers Delrin® Ball

Part No.	Body Color	End Pressure Pounds		A	B	C	Ball Dia. D	Net lbs Per 100
		Start	Full					
10258-D	White	2.0	4.0	1/4-20	17/32	.035	.125	1/4
10259-D	Black	3.0	7.0	1/4-20	17/32	.035	.125	1/4
10260-D	Gold	4.0	12.0	1/4-20	17/32	.035	.125	1/4
10261-D	White	2.0	4.5	5/16-18	37/64	.040	.156	1/4
10262-D	Black	4.0	9.0	5/16-18	37/64	.040	.156	1/4
10263-D	Gold	6.0	17.0	5/16-18	37/64	.040	.156	1/4
10264-D	White	2.5	5.0	3/8-16	5/8	.048	.187	1/2
10265-D	Black	5.0	10.0	3/8-16	5/8	.048	.187	1/2
10266-D	Gold	6.0	21.0	3/8-16	5/8	.048	.187	1/2

White - Light Pressures

Black - Medium Pressures

Gold - Heavy Pressures

Balls are 440 Stainless.

Delrin® body has a limited high temperature stability of 180° F.

Delrin® body ball plungers have bottom end slot only.

Delrin® is high strength with good wear resistant properties.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

Looking for Something Special?

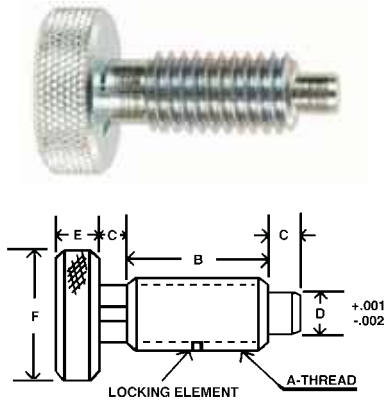
Northwestern

Northwestern Tools, a leading manufacturer of Spring and Ball Plungers, is looking for Special Applications for Spring Loaded Devices.

With over 50 years of design engineering expertise and our quick response from quote to delivery, we are ready to help solve any challenges that you might face.

Northwestern Tools also offers a complete line of standard Spring and Ball Plungers supported by one of the largest inventories in the industry!

Spring & Ball Plungers



Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Available with or without locking element.

To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

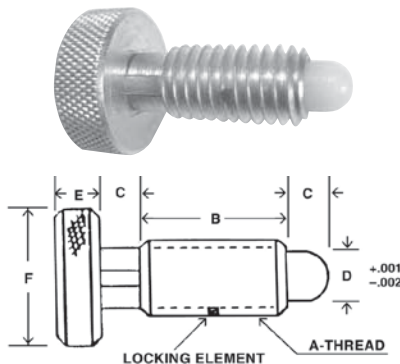
All light pressure have an "L" stamped into the knurl.

Used in machining applications as positioners, loading pins and indexing devices.

Improved design allows plunger nose to be locked in a fully retracted position. Plunger nose has a chamfered end to assure easy alignment.

Plunger can be withdrawn completely into the body and locked in a fully retracted position. To engage the plunger, simply turn to line up with slot in body.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.



Hand Retractable Plungers Knurled Head Plungers - Locking

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.001 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
33809	33819	1.0	3.5	10-32	13/32	3/32	.104	3/16	3/8	1
33810	33820	1.0	5.0	1/4-20	1/2	1/8	.124	1/4	1/2	3
33811	33821	1.5	6.0	5/16-18	5/8	3/16	.155	9/32	5/8	5
33812	33822	1.5	8.0	3/8-16	3/4	7/32	.186	5/16	3/4	7
33813	33823	2.5	10.0	1/2-13	7/8	1/4	.249	3/8	1	13
33813A	33823A	5.0	10.0	5/8-11	1	5/16	.311	13/32	1-1/8	20

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.001 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
33814	33824	0.5	2.0	10-32	13/32	3/32	.104	3/16	3/8	1
33815	33825	0.5	2.5	1/4-20	1/2	1/8	.124	1/4	1/2	3
33816	33826	0.75	3.0	5/16-18	5/8	3/16	.155	9/32	5/8	5
33817	33827	0.75	4.0	3/8-16	3/4	7/32	.186	5/16	3/4	7
33818	33828	1.25	5.0	1/2-13	7/8	1/4	.249	3/8	1	13
33818A	33828A	3.0	6.0	5/8-11	1	5/16	.311	13/32	1-1/8	20

Hand Retractable Plungers Knurled Head Plungers - Locking Radiused Delrin® Nose

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.001 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
33601	33617	1.0	5.0	1/4-20	1/2	1/8	.144	1/4	1/2	3
33602	33618	1.5	6.0	5/16-18	5/8	3/16	.179	9/32	5/8	5
33603	33619	1.5	8.0	3/8-16	3/4	7/32	.216	5/16	3/4	7
33604	33620	2.5	10.0	1/2-13	7/8	1/4	.310	3/8	1	13
33605	33621	5.0	10.0	5/8-11	1	5/16	.373	13/32	1-1/8	20

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.001 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
33609	33625	0.5	2.5	1/4-20	1/2	1/8	.144	1/4	1/2	3
33610	33626	0.75	3.0	5/16-18	5/8	3/16	.179	9/32	5/8	5
33611	33627	0.75	4.0	3/8-16	3/4	7/32	.216	5/16	3/4	7
33612	33628	1.25	5.0	1/2-13	7/8	1/4	.310	3/8	1	13
33613	33629	3.0	6.0	5/8-11	1	5/16	.373	13/32	1-1/8	20

Note: Radiused Delrin® nose has a larger diameter (D column) than the standard Knurled Head Hand Retractable Plunger.

Metric Hand Retractable Plungers Knurled Head Plungers - Locking

Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.25 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33829	33829-SS	4.5	15.5	M5 x 0.8	10.3	2.36	2	4.7	9.5	1
33830	33830-SS	4.5	22	M6 x 1.0	12.7	3.17	3	6.3	12.7	3
33831	33831-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4	7.0	15.8	5
33832	33832-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5	7.9	19.0	7
33833	33833-SS	11	44.5	M12 x 1.75	22.2	6.35	6	9.4	25.4	13
33833A	33833A-SS	22	44.5	M16 x 2.0	25.4	7.92	8	10.3	28.6	20

Light Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.25 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33834	33834-SS	2	9	M5 x 0.8	10.3	2.36	2	4.7	9.5	1
33835	33835-SS	2	11	M6 x 1.0	12.7	3.17	3	6.3	12.7	3
33836	33836-SS	3	13	M8 x 1.25	15.8	4.75	4	7.0	15.8	5
33837	33837-SS	3	18	M10 x 1.5	19.0	5.50	5	7.9	19.0	7
33838	33838-SS	5.5	22	M12 x 1.75	22.2	6.35	6	9.4	25.4	13
33838A	33838A-SS	13	26.5	M16 x 2.0	25.4	7.92	8	10.3	28.6	20

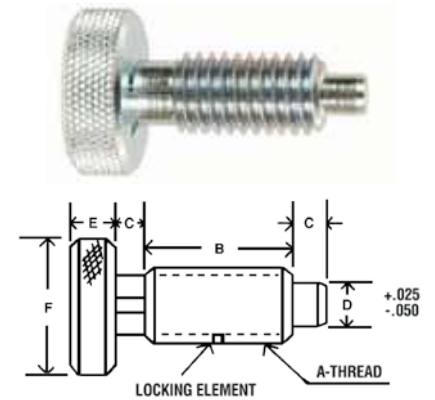
Now available in stainless.

Metric Hand Retractable Plungers Knurled Head Plungers - Locking Radiused Delrin® Nose

Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.25 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33863	33863-SS	4.5	22	M6 x 1.0	12.7	3.17	3.65	6.3	12.7	2
33864	33864-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4.54	7.0	15.8	3-1/2
33865	33865-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5.48	7.9	19.0	6
33866	33866-SS	11	44.5	M12 x 1.75	22.2	6.35	7.87	9.4	25.4	12
33867	33867-SS	22	44.5	M16 x 2.0	25.4	7.92	9.47	10.3	28.6	18-1/2

Light Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.25 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33870	33870-SS	2	11	M6 x 1.0	12.7	3.17	3.65	6.3	12.7	2
33871	33871-SS	3	13	M8 x 1.25	15.8	4.75	4.54	7.0	15.8	3-1/2
33872	33872-SS	3	18	M10 x 1.5	19.0	5.50	5.48	7.9	19.0	6
33873	33873-SS	5.5	22	M12 x 1.75	22.2	6.35	7.87	9.4	25.4	12
33874	33874-SS	13	26.5	M16 x 2.0	25.4	7.92	9.47	10.3	28.6	18-1/2

Note: Radiused Delrin® nose has a larger diameter (D column) than the standard Knurled Head Hand Retractable Plunger



Zinc Plated Steel 12L14 or Stainless Steel.

All stainless parts are made of 303 material.

All Dimensions in Millimeters

Available with or without locking element.

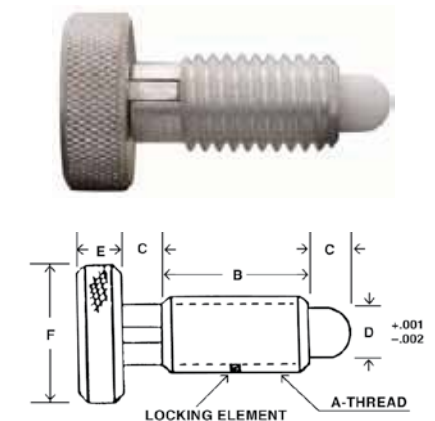
To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

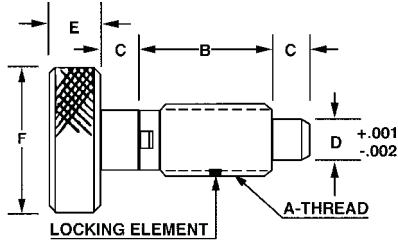
All light pressure have an "L" stamped into the knurl.

Plunger can be withdrawn completely into the body and locked in a fully retracted position. To engage the plunger, simply turn to line up with slot in body.

End pressures are given in Newtons. Full pressures are the force Newtons needed to move the nose the distance shown in "C" column.



Spring & Ball Plungers



Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

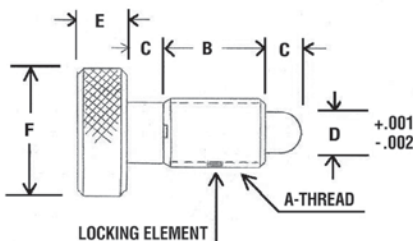
Available with or without locking element.

To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

All light pressure have an "L" stamped into the knurl.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.



Hand Retractable Plungers Knurled Head Plungers - Non-Locking

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
34102	34122	1.0	3.5	10-32	13/32	3/32	.104	3/16	3/8	1
34104	34124	1.0	5.0	1/4-20	1/2	1/8	.124	1/4	1/2	3
34106	34126	1.5	6.0	5/16-18	5/8	3/16	.155	9/32	5/8	5
34108	34128	1.5	8.0	3/8-16	3/4	7/32	.186	5/16	3/4	7
34110	34130	2.5	10.0	1/2-13	7/8	1/4	.249	3/8	1	13
34111	34131	5.0	10.0	5/8-11	1	5/16	.311	13/32	1-1/8	20

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
34112	34132	0.5	2.0	10-32	13/32	3/32	.104	3/16	3/8	1
34114	34134	0.5	2.5	1/4-20	1/2	1/8	.124	1/4	1/2	3
34116	34136	0.75	3.0	5/16-18	5/8	3/16	.155	9/32	5/8	5
34118	34138	0.75	4.0	3/8-16	3/4	7/32	.186	5/16	3/4	7
34120	34140	1.25	5.0	1/2-13	7/8	1/4	.249	3/8	1	13
34121	34141	3.0	6.0	5/8-11	1	5/16	.311	13/32	1-1/8	20

Hand Retractable Plungers Knurled Head Plungers - Non-Locking Radiused Delrin® Nose

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
34220	34220-SS	1.0	5.0	1/4-20	1/2	1/8	.144	1/4	1/2	2
34221	34221-SS	1.5	6.0	5/16-18	5/8	3/16	.179	9/32	5/8	3-1/2
34222	34222-SS	1.5	8.0	3/8-16	3/4	7/32	.216	5/16	3/4	5-3/4
34223	34223-SS	2.5	10.0	1/2-13	7/8	1/4	.310	3/8	1	12
34224	34224-SS	5.0	10.0	5/8-11	1	5/16	.373	13/32	1-1/8	18-1/4

Light Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
34228	34228-SS	0.5	2.5	1/4-20	1/2	1/8	.144	1/4	1/2	2
34229	34229-SS	0.75	3.0	5/16-18	5/8	3/16	.179	9/32	5/8	3-1/2
34230	34230-SS	0.75	4.0	3/8-16	3/4	7/32	.216	5/16	3/4	5-3/4
34231	34231-SS	1.25	5.0	1/2-13	7/8	1/4	.310	3/8	1	12
34232	34232-SS	3.0	6.0	5/8-11	1	5/16	.373	13/32	1-1/8	18-1/4

Note: Radiused Delrin® nose has a larger diameter (D column) than the standard Knurled Head Hand Retractable Plunger

Ask for quoted price for 500 or more of any one item.

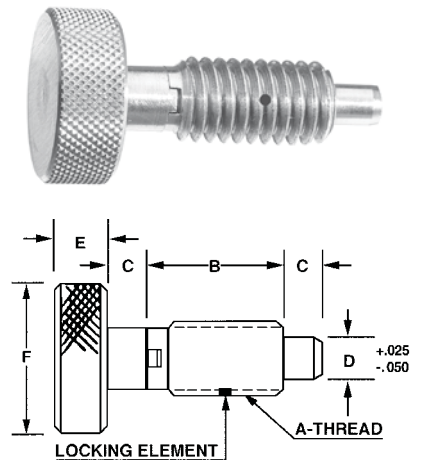
For more information, check out our website:

www.northwesternertools.com

Metric Hand Retractable Plungers Knurled Head Plungers - Non-Locking

Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33876	33876-SS	4.5	15.5	M5 x 0.8	10.3	2.36	2	4.7	9.5	1
33877	33877-SS	4.5	22	M6 x 1.0	12.7	3.17	3	6.3	12.7	3
33878	33878-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4	7.0	15.8	5
33879	33879-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5	7.9	19.0	7
33880	33880-SS	11	44.5	M12 x 1.75	22.2	6.35	6	9.4	25.4	13
33881	33881-SS	22	44.5	M16 x 2.0	25.4	7.92	8	10.3	28.6	20

Light Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33883	33883-SS	2	9	M5 x 0.8	10.3	2.36	2	4.7	9.5	1
33884	33884-SS	2	11	M6 x 1.0	12.7	3.17	3	6.3	12.7	3
33885	33885-SS	3	13	M8 x 1.25	15.8	4.75	4	7.0	15.8	5
33886	33886-SS	3	18	M10 x 1.5	19.0	5.50	5	7.9	19.0	7
33887	33887-SS	5.5	22	M12 x 1.75	22.2	6.35	6	9.4	25.4	13
33888	33888-SS	13	26.5	M16 x 2.0	25.4	7.92	8	10.3	28.6	20



Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

All Dimensions in Millimeters

Available with or without locking element.

To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

All light pressure have an "L" stamped into the knurl.

End pressures are given in Newtons. Full pressures are the force Newtons needed to move the nose the distance shown in "C" column.

Metric Hand Retractable Plungers Knurled Head Plungers - Non-Locking Radiused Delrin® Nose

Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33891	33891-SS	4.5	22	M6 x 1.0	12.7	3.17	3.65	6.3	12.7	2
33892	33892-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4.54	7.0	15.8	3-1/2
33893	33893-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5.48	7.9	19.0	6
33894	33894-SS	11	44.5	M12 x 1.75	22.2	6.35	7.87	9.4	25.4	12
33895	33895-SS	22	44.5	M16 x 2.0	25.4	7.92	9.47	10.3	28.6	18-1/2

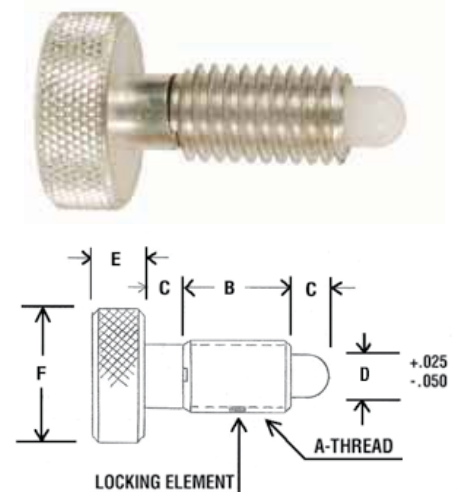
Light Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
33897	33897-SS	2	11	M6 x 1.0	12.7	3.17	3.65	6.3	12.7	2
33898	33898-SS	3	13	M8 x 1.25	15.8	4.75	4.54	7.0	15.8	3-1/2
33899	33899-SS	3	18	M10 x 1.5	19.0	5.50	5.48	7.9	19.0	6
33900	33900-SS	5.5	22	M12 x 1.75	22.2	6.35	7.87	9.4	25.4	12
33901	33901-SS	13	26.5	M16 x 2.0	25.4	7.92	9.47	10.3	28.6	18-1/2

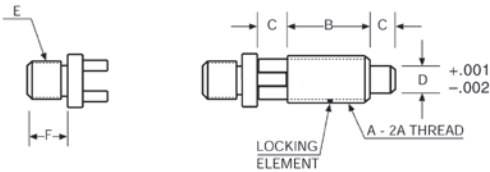
Note: Radiused Delrin® nose has a larger diameter (D column) than the standard Knurled Head Hand Retractable Plunger

Ask for quoted price for 500 or more of any one item.

For more information, check out our website:

www.northwesternertools.com





The Threaded Adapter™ is designed to accept any internally threaded knob or handle.

Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Plunger nose has a chamfered end to assure easy alignment.

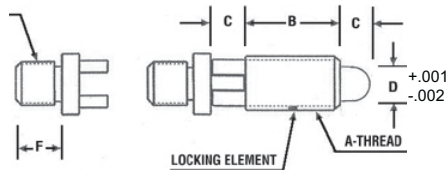
Available with or without locking element.

To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

Plunger can be withdrawn completely into the body and locked in a fully retracted position. To engage the plunger, simply turn to line up with slot in body.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.



PATENT NO. US 7,255,020

Hand Retractable Plungers Threaded Adapter™ - Locking

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.01 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
34020	34040	1.0	3.0	10-32	13/32	3/32	.104	10-32	15/64	3/4
34022	34042	1.0	5.0	1/4-20	1/2	1/8	.124	10-32	15/64	1
34024	34044	1.5	6.0	5/16-18	5/8	3/16	.155	1/4-20	11/32	2
34026	34046	1.5	8.0	3/8-16	3/4	7/32	.186	5/16-18	13/32	3
34028	34048	2.5	10.0	1/2-13	7/8	1/4	.249	3/8-16	7/16	6
34029	34049	5.0	10.0	5/8-11	1	5/16	.311	1/2-13	7/16	11

Light Pressure - Green Color Code

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.01 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
34030	34050	.5	1.5	10-32	13/32	3/32	.104	10-32	15/64	3/4
34032	34052	.5	2.5	1/4-20	1/2	1/8	.124	10-32	15/64	1
34034	34054	.75	3.0	5/16-18	5/8	3/16	.155	1/4-20	11/32	2
34036	34056	.75	4.0	3/8-16	3/4	7/32	.186	5/16-18	13/32	3
34038	34058	1.25	5.0	1/2-13	7/8	1/4	.249	3/8-16	7/16	6
34039	34059	3.0	6.0	5/8-11	1	5/16	.311	1/2-13	7/16	11

10-32 Thread Size not available in Star Type Knob

Northwestern offers these two styles of knobs for use with this adapter to make a complete assembly. These knobs are sold separately online at: www.northwesternertools.com



Shown with optional knob

Hand Retractable Plungers Threaded Adapter™ - Locking Radiused Delrin® Nose

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.01 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
34236	34236-SS	1.0	5.0	1/4-20	1/2	1/8	.144	10-32	15/64	1
34237	34237-SS	1.5	6.0	5/16-18	5/8	3/16	.179	1/4-20	11/32	1-3/4
34238	34238-SS	1.5	8.0	3/8-16	3/4	7/32	.216	5/16-18	13/32	2-3/4
34239	34239-SS	2.5	10.0	1/2-13	7/8	1/4	.310	3/8-16	7/16	5-1/4
34240	34240-SS	5.0	10.0	5/8-11	1	5/16	.373	1/2-13	7/16	10

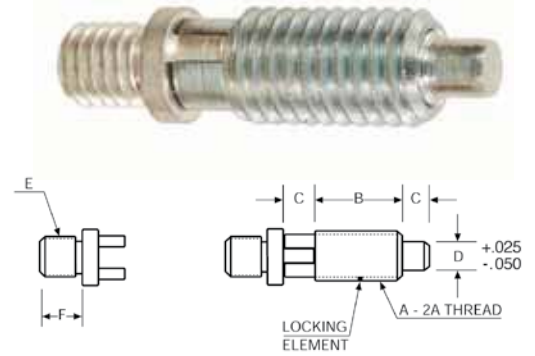
Light Pressure - Green Color Code

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.01 -0.002 D	E	F	Net lbs Per 100
		Start	Full							
34244	34244-SS	.5	1.5	1/4-20	1/2	1/8	.144	10-32	15/64	1
34245	34245-SS	.5	2.5	5/16-18	5/8	3/16	.179	1/4-20	11/32	1-3/4
34246	34246-SS	.75	3.0	3/8-16	3/4	7/32	.216	5/16-18	13/32	2-3/4
34247	34247-SS	.75	4.0	1/2-13	7/8	1/4	.310	3/8-16	7/16	5-1/4
34248	34248-SS	1.25	5.0	5/8-11	1	5/16	.373	1/2-13	7/16	10

Metric Hand Retractable Plungers Threaded Adapter™ - Locking

Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34060A	34060A-SS	4.5	15.5	M5 x 0.8	10.3	2.36	2	10-32	5.9	3/4
34060	34060-SS	4.5	22	M6 x 1.0	12.7	3.17	3	10-32	5.9	1
34062	34062-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4	1/4-20	8.7	2
34064	34064-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5	5/16-18	10.3	3
34066	34066-SS	11	44.5	M12 x 1.75	22.2	6.35	6	3/8-16	11.1	6
34067	34067-SS	22	44.5	M16 x 2.0	25.4	7.92	8	1/2-13	11.1	11

Light Pressure - Green Color Code										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34068A	34068A-SS	2	9	M5 x 0.8	10.3	2.36	2	10-32	5.9	3/4
34068	34068-SS	2	11	M6 x 1.0	12.7	3.17	3	10-32	5.9	1
34070	34070-SS	3	13	M8 x 1.25	15.8	4.75	4	1/4-20	8.7	2
34072	34072-SS	3	18	M10 x 1.5	19.0	5.50	5	5/16-18	10.3	3
34074	34074-SS	5.5	22	M12 x 1.75	22.2	6.35	6	3/8-16	11.1	6
34075	34075-SS	13	26.5	M16 x 2.0	25.4	7.92	8	1/2-13	11.1	11



The Threaded Adapter™ is designed to accept any internally threaded knob or handle.

Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Plunger nose has a chamfered end to assure easy alignment.

Available with or without locking element.

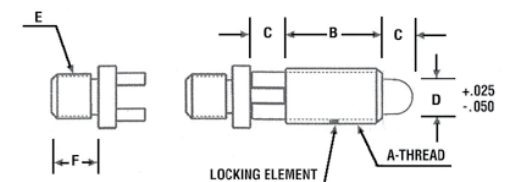
To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

All Dimensions in Millimeters except "E" column

Plunger can be withdrawn completely into the body and locked in a fully retracted position. To engage the plunger, simply turn to line up with slot in body.

End pressures are given in Newtons. Full pressures are the force Newtons needed to move the nose the distance shown in "C" column.



PATENT NO. US 7,255,020

10-32 Thread Size not available in Star Type Knob

Northwestern offers these two styles of knobs for use with this adapter to make a complete assembly. These knobs are sold separately online at: www.northwesterntools.com



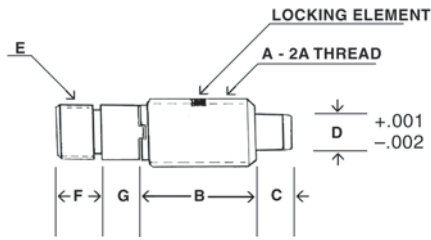
Shown with optional knob

Metric Hand Retractable Plungers Threaded Adapter™ - Locking Radiused Delrin® Nose

Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34078	34078-SS	4.5	22	M6 x 1.0	12.7	3.17	3.65	10-32	5.9	1
34079	34079-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4.54	1/4-20	8.7	1-3/4
34080	34080-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5.48	5/16-18	10.3	2-3/4
34081	34081-SS	11	44.5	M12 x 1.75	22.2	6.35	7.87	3/8-16	11.1	5-1/4
34082	34082-SS	22	44.5	M16 x 2.0	25.4	7.92	9.47	1/2-13	11.1	10

Light Pressure - Green Color Code										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34085	34085-SS	2	11	M6 x 1.0	12.7	3.17	3.65	10-32	5.9	1
34086	34086-SS	3	13	M8 x 1.25	15.8	4.75	4.54	1/4-20	8.7	1-3/4
34087	34087-SS	3	18	M10 x 1.5	19.0	5.50	5.48	5/16-18	10.3	2-3/4
34088	34088-SS	5.5	22	M12 x 1.75	22.2	6.35	7.87	3/8-16	11.1	5-1/4
34089	34089-SS	13	26.5	M16 x 2.0	25.4	7.92	9.47	1/2-13	11.1	10

Spring & Ball Plungers



The Threaded Adapter™ is designed to accept any internally threaded knob or handle.

Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Plunger nose has a chamfered end to assure easy alignment.

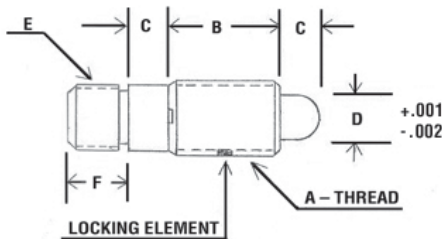
Available with or without locking element.

To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.

Plunger can be withdrawn completely into the body.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.



PATENT NO. US 7,255,020

Hand Retractable Plungers Threaded Adapter™ - Non-Locking

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	G
		Start	Full							
34142	34162	1.0	3.5	10-32	13/32	3/32	.104	10-32	15/64	.096
34144	34164	1.0	5.0	1/4-20	1/2	1/8	.124	10-32	15/64	.130
34146	34166	1.5	6.0	5/16-18	5/8	3/16	.155	1/4-20	11/32	.192
34148	34168	1.5	8.0	3/8-16	3/4	7/32	.186	5/16-18	13/32	.223
34150	34170	2.5	10.0	1/2-13	7/8	1/4	.249	3/8-16	7/16	.255
34151	34171	5.0	10.0	5/8-11	1	5/16	.311	1/2-13	7/16	.317

Light Pressure - Green Color Code

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	G
		Start	Full							
34152	34172	0.5	2.0	10-32	13/32	3/32	.104	10-32	15/64	.096
34154	34174	0.5	2.5	1/4-20	1/2	1/8	.124	10-32	15/64	.130
34156	34176	0.75	3.0	5/16-18	5/8	3/16	.155	1/4-20	11/32	.192
34158	34178	0.75	4.0	3/8-16	3/4	7/32	.186	5/16-18	13/32	.223
34160	34180	1.25	5.0	1/2-13	7/8	1/4	.249	3/8-16	7/16	.255
34161	34181	3.0	6.0	5/8-11	1	5/16	.311	1/2-13	7/16	.317

Shown with optional knob



10-32 Thread
Size not available in Start Type Knob



Hand Retractable Plungers Threaded Adapter™ - Non-Locking Radiused Delrin® Nose

Heavy Pressure

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
34250	34250-SS	1.0	5.0	1/4-20	1/2	1/8	.144	10-32	15/64	3/4
34251	34251-SS	1.5	6.0	5/16-18	5/8	3/16	.179	1/4-20	11/32	1-1/2
34252	34252-SS	1.5	8.0	3/8-16	3/4	7/32	.216	5/16-18	13/32	2-1/2
34253	34253-SS	2.5	10.0	1/2-13	7/8	1/4	.310	3/8-16	7/16	4-3/4
34254	34254-SS	5.0	10.0	5/8-11	1	5/16	.373	1/2-13	7/16	9

Light Pressure - Green Color Code

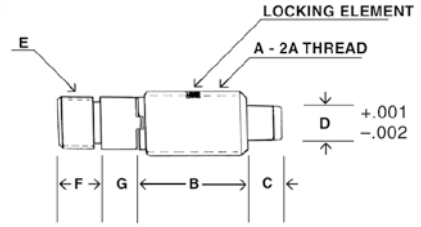
Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+.001 -.002 D	E	F	Net lbs Per 100
		Start	Full							
34258	34258-SS	0.5	2.5	1/4-20	1/2	1/8	.144	10-32	15/64	3/4
34259	34259-SS	0.75	3.0	5/16-18	5/8	3/16	.179	1/4-20	11/32	1-1/2
34260	34260-SS	0.75	4.0	3/8-16	3/4	7/32	.216	5/16-18	13/32	2-1/2
34261	34261-SS	1.25	5.0	1/2-13	7/8	1/4	.310	3/8-16	7/16	4-3/4
34262	34262-SS	3.0	6.0	5/8-11	1	5/16	.373	1/2-13	7/16	9

Northwestern offers these two styles of knobs for use with this adapter to make a complete assembly. These knobs are sold separately online at: www.northwesternertools.com

**Metric Hand Retractable Plungers
Threaded Adapter™ - Non-Locking**

Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34184	34184-SS	4.5	15.5	M5 x 0.8	10.3	2.36	2	10-32	5.9	1/2
34185	34185-SS	4.5	22	M6 x 1.0	12.7	3.17	3	10-32	5.9	3/4
34186	34186-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4	1/4-20	8.7	1-1/2
34187	34187-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5	5/16-18	10.3	2-3/4
34188	34188-SS	11	44.5	M12 x 1.75	22.2	6.35	6	3/8-16	11.1	5-1/4
34189	34189-SS	22	44.5	M16 x 2.0	25.4	7.92	8	1/2-13	11.1	10

Light Pressure - Green Color Code										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34191	34191-SS	2	9	M5 x 0.8	10.3	2.36	2	10-32	5.9	1/2
34192	34192-SS	2	11	M6 x 1.0	12.7	3.17	3	10-32	5.9	3/4
34193	34193-SS	3	13	M8 x 1.25	15.8	4.75	4	1/4-20	8.7	1-1/2
34194	34194-SS	3	18	M10 x 1.5	19.0	5.50	5	5/16-18	10.3	2-3/4
34195	34195-SS	5.5	22	M12 x 1.75	22.2	6.35	6	3/8-16	11.1	5-1/4
34196	34196-SS	13	26.5	M16 x 2.0	25.4	7.92	8	1/2-13	11.1	10



The Threaded Adapter™ is designed to accept any internally threaded knob or handle.

Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Plunger nose has a chamfered end to assure easy alignment.

Available with or without locking element.

To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.



**Metric Hand Retractable Plungers
Threaded Adapter™ - Non-Locking
Radiused Delrin® Nose**

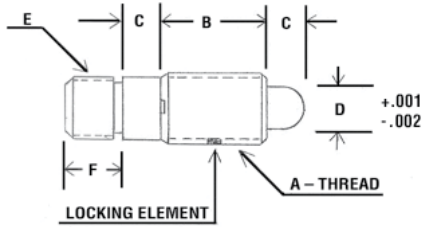
Heavy Pressure										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34201	34201-SS	4.5	22	M6 x 1.0	12.7	3.17	3.65	10-32	5.9	3/4
34202	34202-SS	6.5	26.5	M8 x 1.25	15.8	4.75	4.54	1/4-20	8.7	1-1/2
34203	34203-SS	6.5	35.5	M10 x 1.5	19.0	5.50	5.48	5/16-18	10.3	2-1/2
34204	34204-SS	11	44.5	M12 x 1.75	22.2	6.35	7.87	3/8-16	11.1	4-3/4
34205	34205-SS	22	44.5	M16 x 2.0	25.4	7.92	9.47	1/2-13	11.1	9

Light Pressure - Green Color Code										
Steel Part No.	Stainless Steel Part No.	End Pressure Newtons		Class 6g ISO A	B	C	+0.025 -0.050 D	E	F	Net lbs Per 100
		Start	Full							
34210	34210-SS	2	11	M6 x 1.0	12.7	3.17	3.65	10-32	5.9	3/4
34211	34211-SS	3	13	M8 x 1.25	15.8	4.75	4.54	1/4-20	8.7	1-1/2
34212	34212-SS	3	18	M10 x 1.5	19.0	5.50	5.48	5/16-18	10.3	2-1/2
34213	34213-SS	5.5	22	M12 x 1.75	22.2	6.35	7.87	3/8-16	11.1	4-3/4
34214	34214-SS	13	26.5	M16 x 2.0	25.4	7.95	9.47	1/2-13	11.1	9

All Dimensions in Millimeters except "E" column

Plunger can be withdrawn completely into the body.

End pressures are given in Newtons. Full pressures are the force Newtons needed to move the nose the distance shown in "C" column.



PATENT NO. US 7,255,020



Hand Retractable Plungers

Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Plunger nose has a chamfered end to assure easy alignment.

Designed to function where space is limited.

Easy to grasp ring allows you to hold the plunger back while changing work piece.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

Available with or without locking element.

To order without locking element, add a "P" to the end of the part number.

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of mating thread to prevent damaging the element.

Delrin® noses prevent marring of aluminum, brass or other soft materials.

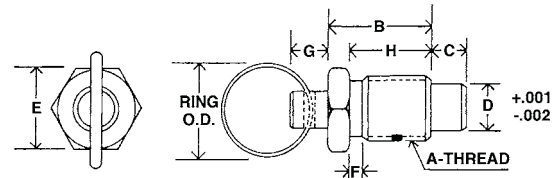
Used in machining applications as positioners, loading pins and indexing devices.

Plunger can be withdrawn completely into the body and easily re-engaged.

Pull Ring - Short - Non-Locking Plungers

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.01 -0.002 D	E	F	G	H	Ring O. D.	Net lbs Per 100
		Start	Full										
33702	33712	.50	2.0	1/4-20	7/16	3/16	.156	1/4	1/32	5/32	9/32	3/4	1
33703	33713	.75	2.75	5/16-18	17/32	1/4	.186	5/16	3/32	3/16	23/64	3/4	1.5
33704	33714	.75	3.0	3/8-16	5/8	9/32	.250	3/8	1/8	3/16	7/16	3/4	2
33706	33716	1.0	4.0	1/2-13	13/16	3/8	.312	1/2	5/32	1/4	9/16	1	4-1/4
33708	33718	1.25	5.0	5/8-11	1	7/16	.375	5/8	5/32	5/16	11/16	1	8

All parts conform to TCMAI standards

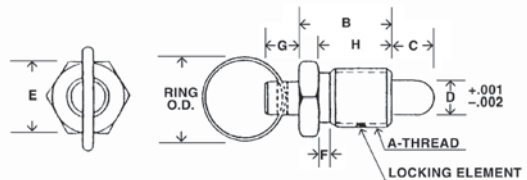
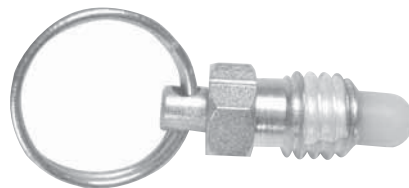


Hand Retractable Plungers

Pull Ring - Short - Non-Locking Plungers Radiused Delrin® Nose

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	+0.01 -0.002 D	E	F	G	H	Ring O. D.	Net lbs Per 100
		Start	Full										
33633	33641	.50	2.0	1/4-20	7/16	3/16	.156	1/4	1/32	5/32	9/32	3/4	1
33634	33642	.75	2.75	5/16-18	17/32	1/4	.186	5/16	3/32	3/16	23/64	3/4	1.5
33635	33643	.75	3.0	3/8-16	5/8	9/32	.250	3/8	1/8	3/16	7/16	3/4	2
33636	33644	1.0	4.0	1/2-13	13/16	3/8	.312	1/2	5/32	1/4	9/16	1	4-1/4
33637	33645	1.25	5.0	5/8-11	1	7/16	.375	5/8	5/32	5/16	11/16	1	8

All parts conform to TCMAI standards

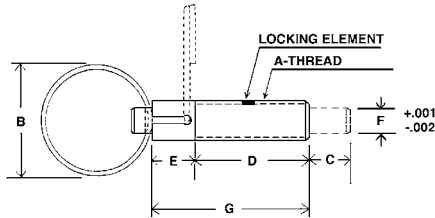


Hand Retractable Plungers

Pull Ring - Standard Length - Locking Plungers

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	D	E	F	G	Net lbs Per 100
		Start	Full								
33762	33772	1.0	2.5	1/4-20	1	1/4	13/16	5/16	.156	1-1/8	1-1/2
33764	33774	2.0	4.0	3/8-16	1-1/4	3/8	1-1/4	7/16	.250	1-11/16	4-1/4
33766	33776	2.5	5.0	1/2-13	1-3/8	1/2	1-7/16	9/16	.312	2	9

All parts conform to TCMAI standards



Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Plunger nose has a chamfered end to assure easy alignment.

Easy to grasp ring allows you to hold the plunger back while changing work piece.

End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

Available with or without locking element.

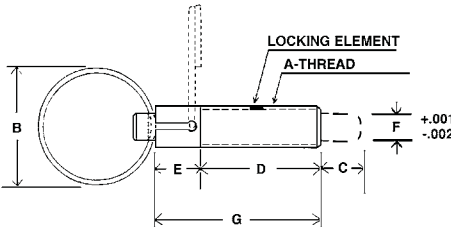
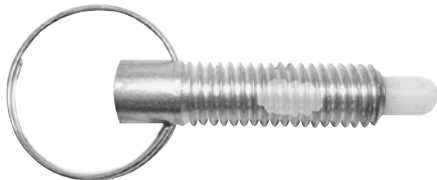
To order without locking element, add a "P" to the end of the part number.

Hand Retractable Plungers

Pull Ring - Standard Length - Locking Plungers Radiused Delrin® Nose

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	B	C	D	E	F	G	Net lbs Per 100
		Start	Full								
33681	33689	1.0	2.5	1/4-20	1	1/4	13/16	5/16	.156	1-1/8	1-1/2
33683	33691	2.0	4.0	3/8-16	1-1/4	3/8	1-1/4	7/16	.250	1-11/16	4-1/4
33684	33692	2.5	5.0	1/2-13	1-3/8	1/2	1-7/16	9/16	.312	2	9

All parts conform to TCMAI standards



The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of mating thread to prevent damaging the element.

Delrin® noses prevent marring of aluminum, brass or other soft materials.

Used in machining applications as positioners, loading pins and indexing devices

Plunger can be withdrawn completely into the body and easily re-engaged. To engage the plunger, simply turn the ring to line up with slot in body.

NEW SIZES!

Hand Retractable Plungers

Long Reach - Standard Length - Locking Plungers

Zinc Plated 12L14 Steel or Stainless Steel.

All stainless parts are made of 303 material.

Plunger nose has a chamfered end to assure easy alignment.

Available with or without locking element.

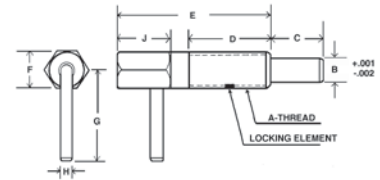
To order without locking element, add a "P" to the end of the part number.

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	+0.01 -0.02 B	C	D	E	F	G	H	J	Net lbs Per 100
		Start	Full										
33962	33972	0.5	2.5	1/4-20	.156	3/8	5/8	1-1/4	1/4	5/8	3/32	1/2	1-1/2
33963	33973	0.75	3.0	5/16-18	.186	1/2	7/8	1-5/8	5/16	3/4	7/64	9/16	3
33964	33974	0.75	3.75	3/8-16	.250	9/16	1-1/16	2	3/8	15/16	9/64	11/16	5-1/4
33966	33976	1.0	5.0	1/2-13	.312	3/4	1-1/8	2-1/8	1/2	1-1/4	3/16	3/4	10-1/4
33968	33978	1.0	5.0	5/8-11	.375	1	1-3/4	3	5/8	1-5/16	3/16	1-1/16	22-1/4

Long Reach - Short - Locking Plungers

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	+0.01 -0.02 B	C	D	E	F	G	H	J	Net lbs Per 100
		Start	Full										
33922	33932	.125	0.50	1/4-20	.156	3/16	7/16	3/4	1/4	9/16	3/32	1/4	1
33923	33933	.25	1.0	5/16-18	.186	1/4	1/2	7/8	5/16	5/8	7/64	5/16	2
33924	33934	.25	1.25	3/8-16	.250	5/16	5/8	1-1/8	3/8	3/4	9/64	3/8	3
33926	33936	.50	2.0	1/2-13	.312	13/32	7/8	1-1/2	1/2	1	3/16	1/2	7
33928	33938	.75	2.5	5/8-11	.375	1/2	1-1/8	1-7/8	5/8	1-3/16	3/16	5/8	13-1/2

The locking element holds the plunger body securely in place without the need for lock nuts or other devices. We recommend a 90° countersink 1/32" larger than the major diameter of mating thread to prevent damaging the element



All parts conform to TCMAI Standards.

NEW SIZES!

Long Reach - Standard Length - Locking Plungers Radiused Delrin® Nose

Used in machining applications as positioners, loading pins and indexing devices.

Delrin® prevents marring of aluminum, brass or other soft materials.

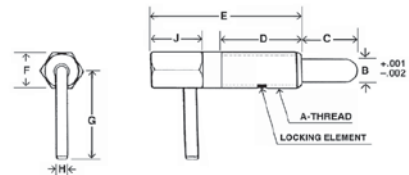
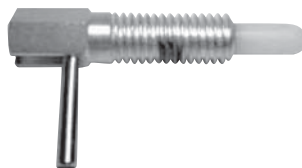
End pressures are given in pounds. Full pressures are the force pounds needed to move the nose the distance shown in "C" column.

Plunger can be withdrawn completely into the body and easily re-engaged. To engage the plunger, simply turn the ring to line up with slot in body.

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	+0.01 -0.02 B	C	D	E	F	G	H	J	Net lbs Per 100
		Start	Full										
33649	33657	0.5	2.5	1/4-20	.156	3/8	5/8	1-1/4	1/4	5/8	3/32	1/2	1-1/2
33650	33658	0.75	3.0	5/16-18	.186	1/2	7/8	1-5/8	5/16	3/4	7/64	9/16	3
33651	33659	0.75	3.75	3/8-16	.250	9/16	1-1/16	2	3/8	15/16	9/64	11/16	5-1/4
33652	33660	1.0	5.0	1/2-13	.312	3/4	1-1/8	2-1/8	1/2	1-1/4	3/16	3/4	10-1/4
33653	33661	1.0	5.0	5/8-11	.375	1	1-3/4	3	5/8	1-5/16	3/16	1-1/16	22-1/4

Long Reach - Short - Locking Plungers Radiused Delrin® Nose

Steel Part No.	Stainless Steel Part No.	End Pressure Pounds		A	+0.01 -0.02 B	C	D	E	F	G	H	J	Net lbs Per 100
		Start	Full										
33665	33673	.125	.50	1/4-20	.156	3/16	7/16	3/4	1/4	9/16	3/32	1/4	1
33666	33674	.25	1.0	5/16-18	.186	1/4	1/2	7/8	5/16	5/8	7/64	5/16	2
33667	33675	.25	1.25	3/8-16	.250	5/16	5/8	1-1/8	3/8	3/4	9/64	3/8	3
33668	33676	.50	2.0	1/2-13	.312	13/32	7/8	1-1/2	1/2	1	3/16	1/2	7
33669	33677	.75	2.5	5/8-11	.375	1/2	1-1/8	1-7/8	5/8	1-3/16	3/16	5/8	13-1/2

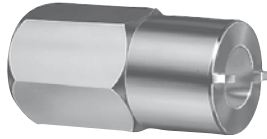


Wrenches

For Ball and Spring Plungers

Part No.	For Plungers With Thread Sizes	Net lbs Per 100
34001	6	1
34002	8 and M4	1
34003	10 and M5	1-1/2
34004	1/4 and M6	1-1/2
34005	5/16 and M8	3
34006	3/8 and M10	3
34007	1/2 and M12	5-1/2
34008	5/8	9
34009	3/4	12-1/2
34010	1	19

These wrenches make it easy to install or remove plungers. They also prevent possible spring damage that can result when a screwdriver is used on the plunger end.



**Heat Treated Steel
Black Oxide Finish**

NEW!

Spring Plunger Mounting Bases

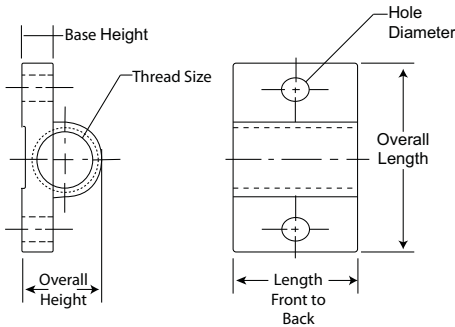
Tooling Flanges

Part No.	Thread Size	Overall Length	Length Front to Back	Overall Height	Base Thickness	Hole Diameter
82601	8-32	.690	.500	.250	.090	1/8
82602	10-32	.690	.500	.270	.130	1/8
82603	1/4-20	.880	.690	.410	.190	9/64
82604	5/16-18	.940	.630	.410	.188	9/64
82605	3/8-16	1.130	.750	.470	.219	5/32
82606	1/2-13	1.500	1.00	.630	.250	13/64
82607	5/8-11	1.880	1.25	.800	.312	17/64

Full range of sizes from 8-32 thru 5/8-11. Used as mounting points for spring plungers and any spring loaded devices. Used for horizontal applications without the need for custom designed blocks and fixtures.

Materials: Steel

Stainless Steel available, page 60



**For more information,
check out our website:
www.northwesternertools.com**

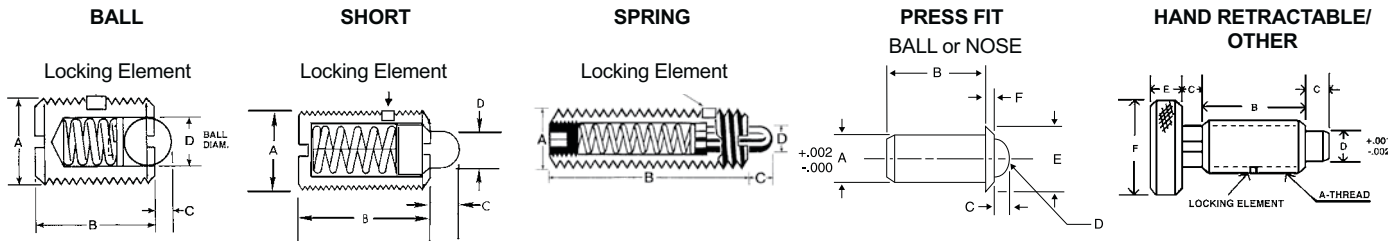
Special Plunger Quotation Request

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____ FAX _____ EMAIL _____



DIMENSION INFORMATION:

Thread / Diameter "A" _____ Body Length "B" _____

Ball / Nose Travel "C" _____ Ball / Nose Diameter "D" _____

Type: Ball _____ Spring _____ Short _____ Press Fit _____ Other _____

Initial Spring Force _____ Final Spring Force _____

Locking Element Required _____ Locking Element Not Required _____

Nose Material: Steel _____ Stainless _____ Delrin® _____ Phenolic _____ Other _____

Ball Material: 440 Stainless _____ Delrin® _____ Other _____

Body Material: Steel _____ Stainless _____ Other _____

Nose Finish _____ Body Finish _____

Application _____

Quantity _____ Delivery Required _____

Additional Comments _____

Photo copy this page for an accurate quote.

Fill in the information regarding the plunger to be quoted. Be as detailed as possible. Fax or mail your request to Northwestern Tools, Inc.



Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing

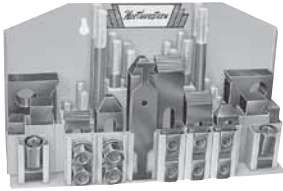
Northwestern



Clamping & Set Up



Deluxe Clamping Kits



All Steel Blocks and Clamps

Kit No.	Stud Size	Table Slot	T-Nut Part No.	T-Nut & Stud Set No.	Step Clamps 2 Each	Step Blocks 2 Each	Net lbs Per Kit
Kits With Standard Blocks 1" Wide							
11152	3/8-16	7/16	47002	40002	12101, 12102, 12103	36101, 36102, 36103	19
11153	3/8-16	1/2	47003	40003	12101, 12102, 12103	36101, 36102, 36103	19
11154	3/8-16	9/16	47004	40004	12101, 12102, 12103	36101, 36102, 36103	19
11155	1/2-13	9/16	47005	40005	12104, 12105, 12106	36101, 36102, 36103	24
11156	1/2-13	5/8	47006	40006	12104, 12105, 12106	36101, 36102, 36103	24
11157	1/2-13	11/16	47007	40007	12104, 12105, 12106	36101, 36102, 36103	24
11158	5/8-11	11/16	47008	40008	12107, 12108, 12109	36101, 36102, 36103	31
11159	5/8-11	3/4	47009	40009	12107, 12108, 12109	36101, 36102, 36103	31
11160	5/8-11	13/16	47010	40010	12107, 12108, 12109	36101, 36102, 36103	32
Kits With Heavy Duty Blocks 1-1/2" Wide							
11161	1/2-13	9/16	47005	40005	12104, 12105, 12106	36104, 36105, 36106	46
11162	1/2-13	5/8	47006	40006	12104, 12105, 12106	36104, 36105, 36106	47
11163	1/2-13	11/16	47007	40007	12104, 12105, 12106	36104, 36105, 36106	47
11164	5/8-11	11/16	47008	40008	12107, 12108, 12109	36104, 36105, 36106	52
11165	5/8-11	3/4	47009	40009	12107, 12108, 12109	36104, 36105, 36106	53
11166	5/8-11	13/16	47010	40010	12107, 12108, 12109	36104, 36105, 36106	53

Each kit Contains:

- 4 Studs of each Length: 3" - 4" - 5" - 6" - 7" - 8"
- 6 T-Slot Nuts
- 4 Flange Nuts
- 4 Coupling Nuts
- 6 Step Blocks
- 6 Step Clamps
- 1 T-Slot Cleaner
- 1 Handy Holder

See page 44 for T-Slot Nut Dimensions.

For your higher clamping requirements consider our Hi-Rise clamping system shown on page 59.

Metric Kits Available, page 40

Each kit provides at least four clamping bolts from 3" up to 15" long

Northwestern's Clamping Kits reduce the set-up time needed on milling machines, boring mills and for other machine table operations. All the studs, nuts, clamps and blocks are kept organized and within easy reach.

When using step blocks with clamps, be certain clamp teeth are fully engaged with teeth on step block to prevent damage to block or clamp.

52 pieces of Set-up Equipment in a heavy duty metal or plastic holder.

For machines with table slots from 7/16" thru 13/16"

With steel or aluminum step blocks

Mounts on the machine, on the wall or sets on a bench.

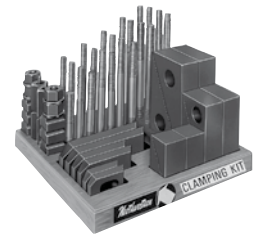
Aluminum Blocks With Steel Clamps

Kit No.	Stud Size	Table Slot	T-Nut Part No.	T-Nut & Stud Set No.	Step Clamps 2 Each	Step Blocks 2 Each	Net lbs Per Kit
Kits With Standard Blocks 1" Wide							
11052	3/8-16	7/16	47002	40002	12101, 12102, 12103	36001, 36002, 36003	16
11053	3/8-16	1/2	47003	40003	12101, 12102, 12103	36001, 36002, 36003	16
11054	3/8-16	9/16	47004	40004	12101, 12102, 12103	36001, 36002, 36003	17
11055	1/2-13	9/16	47005	40005	12104, 12105, 12106	36001, 36002, 36003	21
11056	1/2-13	5/8	47006	40006	12104, 12105, 12106	36001, 36002, 36003	21
11057	1/2-13	11/16	47007	40007	12104, 12105, 12106	36001, 36002, 36003	21
11058	5/8-11	11/16	47008	40008	12107, 12108, 12109	36001, 36002, 36003	28
11059	5/8-11	3/4	47009	40009	12107, 12108, 12109	36001, 36002, 36003	28
11060	5/8-11	13/16	47010	40010	12107, 12108, 12109	36001, 36002, 36003	29
Kits With Heavy Duty Blocks 1-1/2" Wide							
11061	1/2-13	9/16	47005	40005	12104, 12105, 12106	36004, 36005, 36006	35
11062	1/2-13	5/8	47006	40006	12104, 12105, 12106	36004, 36005, 36006	35
11063	1/2-13	11/16	47007	40007	12104, 12105, 12106	36004, 36005, 36006	36
11064	5/8-11	11/16	47008	40008	12107, 12108, 12109	36004, 36005, 36006	41
11065	5/8-11	3/4	47009	40009	12107, 12108, 12109	36004, 36005, 36006	41
11066	5/8-11	13/16	47010	40010	12107, 12108, 12109	36004, 36005, 36006	42

For your higher clamping requirements consider our Hi-Rise clamping system shown on page 59.

Metric Kits Available, page 40

Deluxe Clamping Kits



All Steel Blocks and Clamps							
Kit No.	Stud Size	Table Slot	T-Nut Part No.	T-Nut & Stud Set No.	Step Clamps 2 Each	Step Blocks 2 Each	Net lbs Per Kit
Kits With Standard Blocks 1" Wide							
11101	5/16-18	3/8	47001	40001	12101, 12102, 12103	36101, 36102, 36103	15
11102	3/8-16	7/16	47002	40002	12101, 12102, 12103	36101, 36102, 36103	17
11103	3/8-16	1/2	47003	40003	12101, 12102, 12103	36101, 36102, 36103	17
11104	3/8-16	9/16	47004	40004	12101, 12102, 12103	36101, 36102, 36103	17
11105	1/2-13	9/16	47005	40005	12104, 12105, 12106	36101, 36102, 36103	22
11106	1/2-13	5/8	47006	40006	12104, 12105, 12106	36101, 36102, 36103	22
11107	1/2-13	11/16	47007	40007	12104, 12105, 12106	36101, 36102, 36103	22
11108	5/8-11	11/16	47008	40008	12107, 12108, 12109	36101, 36102, 36103	29
11109	5/8-11	3/4	47009	40009	12107, 12108, 12109	36101, 36102, 36103	29
11110	5/8-11	13/16	47010	40010	12107, 12108, 12109	36101, 36102, 36103	30
Kits with Heavy Duty Blocks 1-1/2" Wide							
11111	1/2-13	9/16	47005	40005	12104, 12105, 12106	36104, 36105, 36106	38
11112	1/2-13	5/8	47006	40006	12104, 12105, 12106	36104, 36105, 36106	39
11113	1/2-13	11/16	47007	40007	12104, 12105, 12106	36104, 36105, 36106	39
11114	5/8-11	11/16	47008	40008	12107, 12108, 12109	36104, 36105, 36106	44
11115	5/8-11	3/4	47009	40009	12107, 12108, 12109	36104, 36105, 36106	45
11116	5/8-11	13/16	47010	40010	12107, 12108, 12109	36104, 36105, 36106	45
11117	3/4-10	13/16	47011	40011	12110, 12111, 12112	36104, 36105, 36106	58
11118	3/4-10	7/8	47012	40012	12110, 12111, 12112	36104, 36105, 36106	59
11119	3/4-10	1	47013	40013	12110, 12111, 12112	36104, 36105, 36106	60
11120	3/4-10	1-1/16	47015	40015	12110, 12111, 12112	36104, 36105, 36106	60
Kits with Double Duty Blocks 2" Wide							
11121	7/8-9	1	47014	40014	12113, 12114, 12115	36107, 36108, 36109	91
11122	1-8	1-1/16	47016	40016	12113, 12114, 12115	36107, 36108, 36109	100

- Each kit Contains:**
- 4 Studs of each Length: 3" - 4" - 5" - 6" - 7" - 8"
 - 6 T-Slot Nuts
 - 4 Flange Nuts
 - 4 Coupling Nuts
 - 6 Step Blocks
 - 6 Step Clamps
 - 1 T-Slot Cleaner
 - 1 Handy Holder

See Page 44 for T-Slot Nut dimensions.

Each kit provides at least four clamping bolts from 3" up to 15" long.

Northwestern's Clamping Kits reduce the set-up time needed on milling machines, boring mills and for other machine table operations. All the studs, nuts, clamps and blocks are kept organized and within easy reach.

When using step blocks with clamps, be certain clamp teeth are fully engaged with teeth on step block to prevent damage to block or clamp.

52 pieces of Set-up Equipment in a heavy duty metal or plastic holder.

For machines with table slots from 7/16" thru 13/16"

With steel or aluminum step blocks

Mounts on the machine, on the wall or sets on a bench.

For your higher clamping requirements consider our Hi-Rise clamping system shown on page 59.

Metric Kits Available, page 40

Aluminum Blocks With Steel Clamps							
Kit No.	Stud Size	Table Slot	T-Nut Part No.	T-Nut & Stud Set No.	Step Clamps 2 Each	Step Blocks 2 Each	Net lbs Per Kit
Kits With Standard Blocks 1" Wide							
11001	5/16-18	3/8	47001	40001	12101, 12102, 12103	36001, 36002, 36003	13
11002	3/8-16	7/16	47002	40002	12101, 12102, 12103	36001, 36002, 36003	14
11003	3/8-16	1/2	47003	40003	12101, 12102, 12103	36001, 36002, 36003	14
11004	3/8-16	9/16	47004	40004	12101, 12102, 12103	36001, 36002, 36003	15
11005	1/2-13	9/16	47005	40005	12104, 12105, 12106	36001, 36002, 36003	20
11006	1/2-13	5/8	47006	40006	12104, 12105, 12106	36001, 36002, 36003	20
11007	1/2-13	11/16	47007	40007	12104, 12105, 12106	36001, 36002, 36003	21
11008	5/8-11	11/16	47008	40008	12107, 12108, 12109	36001, 36002, 36003	26
11009	5/8-11	3/4	47009	40009	12107, 12108, 12109	36001, 36002, 36003	26
11010	5/8-11	13/16	47010	40010	12107, 12108, 12109	36001, 36002, 36003	27
Kits with Heavy Duty Blocks 1-1/2" Wide							
11011	1/2-13	9/16	47005	40005	12104, 12105, 12106	36004, 36005, 36006	27
11012	1/2-13	5/8	47006	40006	12104, 12105, 12106	36004, 36005, 36006	27
11013	1/2-13	11/16	47007	40007	12104, 12105, 12106	36004, 36005, 36006	28
11014	5/8-11	11/16	47008	40008	12107, 12108, 12109	36004, 36005, 36006	33
11015	5/8-11	3/4	47009	40009	12107, 12108, 12109	36004, 36005, 36006	33
11016	5/8-11	13/16	47010	40010	12107, 12108, 12109	36004, 36005, 36006	34
11017	3/4-10	13/16	47011	40011	12110, 12111, 12112	36004, 36005, 36006	48
11018	3/4-10	7/8	47012	40012	12110, 12111, 12112	36004, 36005, 36006	48
11019	3/4-10	1	47013	40013	12110, 12111, 12112	36004, 36005, 36006	49
11020	3/4-10	1-1/16	47015	40015	12110, 12111, 12112	36004, 36005, 36006	50

For your higher clamping requirements consider our Hi-Rise clamping system shown on page 49.

Metric Kits Available, page 40

Metric Clamping Kits

All Steel Blocks and Clamps

Kit No. Wooden Holder	Kit No. Metal Holder	Table Slot	Stud Size	T-Nut & Stud Set No.	Step Clamps 2 Each	Step Blocks 2 Each	Net lbs Per Kit
With Standard Blocks 25 MM Wide							
11508		10	M8	40506	12101, 12102, 12103	36101, 36102, 36103	19
11510	11560	12	M10	40508	12101, 12102, 12103	36101, 36102, 36103	19
11512	11562	14	M12	40514	12104, 12105, 12106	36101, 36102, 36103	24
11516	11566	16	M12	40516	12104, 12105, 12106	36101, 36102, 36103	24
11520	11570	18	M16	40520	12107, 12108, 12109	36101, 36102, 36103	31
11522	11572	20	M16	40522	12107, 12108, 12109	36101, 36102, 36103	31
With Heavy Duty Blocks 38 MM Wide							
11532	11582	14	M12	40514	12104, 12105, 12106	36104, 36105, 36106	46
11536	11586	16	M12	40516	12104, 12105, 12106	36104, 36105, 36106	47
11540	11590	18	M16	40520	12107, 12108, 12109	36104, 36105, 36106	52
11542	11592	20	M16	40522	12107, 12108, 12109	36104, 36105, 36106	53

See pages 41 and 42 for Step Block and Step Clamp dimensions.

Aluminum Blocks With Steel Clamps

Kit No. Wooden Holder	Kit No. Metal Holder	Table Slot	Stud Size	T-Nut & Stud Set No.	Step Clamps 2 Each	Step Blocks 2 Each	Net lbs Per Kit
With Standard Blocks 25 MM Wide							
11608		10	M8	40506	12101, 12102, 12103	36001, 36002, 36003	17
11610	11660	12	M10	40508	12101, 12102, 12103	36001, 36002, 36003	17
11612	11662	14	M12	40514	12104, 12105, 12106	36001, 36002, 36003	21
11616	11666	16	M12	40516	12104, 12105, 12106	36001, 36002, 36003	21
11620	11670	18	M16	40520	12107, 12108, 12109	36001, 36002, 36003	28
11622	11672	20	M16	40522	12107, 12108, 12109	36001, 36002, 36003	28
With Heavy Duty Blocks 38 MM Wide							
11632	11682	14	M12	40514	12104, 12105, 12106	36004, 36005, 36006	35
11636	11686	16	M12	40516	12104, 12105, 12106	36004, 36005, 36006	36
11640	11690	18	M16	40520	12107, 12108, 12109	36004, 36005, 36006	41
11642	11692	20	M16	40522	12107, 12108, 12109	36004, 36005, 36006	42

See pages 41 - 43 for Step Block and Strap Clamp dimensions.

All Dimensions in Millimeters

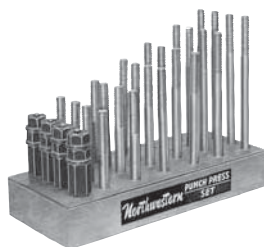
Metric

Punch Press Sets

Set No.	Stud Size	Net lbs Per Set
24508	M8 x 1.25	5
24510	M10 x 1.5	7
24512	M12 x 1.75	11
24516	M16 x 2.0	15

Each Set Contains:

4 Studs of each length per thread size, 8 Flange Nuts, 4 Coupling Nuts, Handy Holder



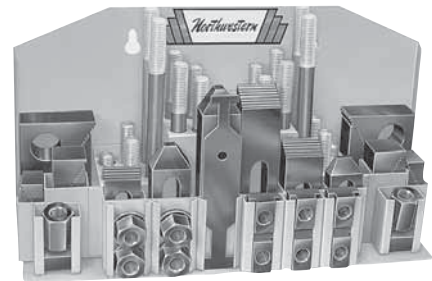
Metric

T-Nut and Stud Sets

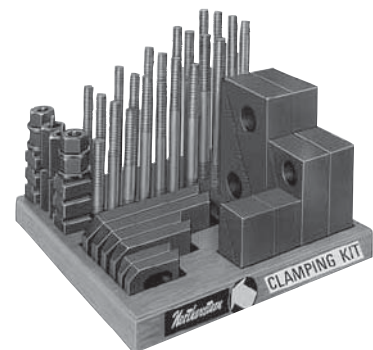
Set No.	Table Slot	Stud Size	T-Nut Part No.	Net lbs Per Set
40506	10	M8 x 1.25	47554	5
40508	12	M10 x 1.5	47558	7
40514	14	M12 x 1.75	47562	11
40516	16	M12 x 1.75	47566	11
40520	18	M16 x 2.0	47570	15
40522	20	M16 x 2.0	47574	15

Each Set Contains:

4 Studs of each length per thread size, 4 Flange Nuts, 4 Coupling Nuts, 6 T-Slot Nuts, 1 T-Slot Cleaner, Handy Holder



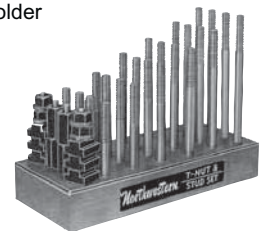
Metal Holder



Wooden Holder

Each kit Contains:

- 4 Studs of each length per thread size
- 6 T-Slot Nuts
- 4 Flange Nuts
- 4 Coupling Nuts
- 6 Step Blocks
- 6 Step Clamps
- 1 T-Slot Cleaner
- 1 Handy Holder



Handy Sets By Northwestern

T-Nut and Stud Sets

Set No.	Ref. No.	Table Slot	T-Nut Part No.	Stud Size	Net lbs Per Set
40001	375-TS	3/8	47001	5/16-18	5
40002	437-TS	7/16	47002	3/8-16	7
40003	500-TS	1/2	47003	3/8-16	7
40004	560-TS	9/16	47004	3/8-16	7
40005	562-TS	9/16	47005	1/2-13	11
40006	625-TS	5/8	47006	1/2-13	11
40007	680-TS	11/16	47007	1/2-13	11
40008	687-TS	11/16	47008	5/8-11	15
40009	750-TS	3/4	47009	5/8-11	15
40010	800-TS	13/16	47010	5/8-11	16
40011	812-TS	13/16	47011	3/4-10	23
40012	875-TS	7/8	47012	3/4-10	24
40013	102-TS	1	47013	3/4-10	25
40014	100-TS	1	47014	7/8-9	31
40015	1060-TS	1-1/16	47015	3/4-10	26
40016	1062-TS	1-1/16	47016	1-8	40

Each Set Contains:

- 4 Studs of each length:
3" - 4" - 5" - 6" - 7" - 8"
- 6 T-Nuts to fit your machine
- 4 Coupling Nuts
- 4 Flange Nuts
- 1 T-Slot Cleaner
- Handy Holder



Each Set Contains:

- 4 Studs of each length:
3" - 4" - 5" - 6" - 7" - 8"
- 4 Coupling Nuts
- 4 Flange Nuts
- Handy Holder



Punch Press Sets

Set No.	Ref. No.	Thread Size	Net lbs Per Set
24001	12-PP	1/2-13	10
24002	58-PP	5/8-11	15
24003	34-PP	3/4-10	22
24004	78-PP	7/8-9	29
24005	10-PP	1-8	38

Use for clamping set-ups on mills, boring machines, presses, etc. For table slots to 1-1/16".

Each set provides at least four clamping bolts from 3" up to 15" long.

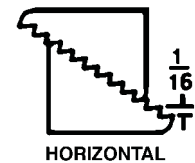
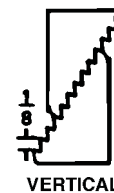
Sets to Fit All Machines - Check Table Slot before Ordering

Step Blocks

Steel

Part No.	Ref. No.	Capacity of Full Block	Height of 1/2 Block	Net lbs Per 100
Standard Blocks 1" Wide				
*36101	1-S	3/4 to 1-1/2	1-1/8	19
*36102	2-S	1-1/8 to 2-1/2	1-3/4	48
*36103	3-S	2-1/2 to 6	3-7/8	181
Heavy Duty Blocks 1-1/2" Wide				
36104	4-S	1-1/2 to 3-3/4	2-3/8	127
*36105	5-S	2-1/2 to 6	3-7/8	288
36106	6-S	3-1/2 to 9	5-1/2	602
Double Duty Blocks 2" Wide				
36107	7-S	1-1/2 to 3-3/4	2-3/8	162
*36108	8-S	2-1/2 to 6	3-7/8	370
36109	9-S	3-1/2 to 9	5-1/2	810
Aluminum				
Part No.	Ref. No.	Capacity of Full Block	Height of 1/2 Block	Net lbs Per 100
Standard Blocks 1" Wide				
36001	1-A	3/4 to 1-1/2	1-1/8	9
36002	2-A	1-1/8 to 2-1/2	1-3/4	20
36003	3-A	2-1/2 to 6	3-7/8	94
Heavy Duty Blocks 1-1/2" Wide				
36004	4-A	1-1/2 to 3-3/4	2-3/8	53
36005	5-A	2-1/2 to 6	3-7/8	138
36006	6-A	3-1/2 to 9	5-1/2	284

* Conform to TCMAI Standards



One Block is Two Pieces,
All Blocks Work with Step Strap Clamps



Black Oxide Finish



6061-T6 Aluminum

Step Block Sets

Steel				
Set No.	Ref. No.	Set Consists of:		Net lbs Per Set
*37101	A-S	4 #36101, 4 #36102, 2 #36103		8
37102	B-S	2 #36101, 2 #36102, 1 #36103		3-1/2
37103	C-S	2 #36101, 2 #36102		2
* Set #37101 only furnished with the wooden holder as shown				
Aluminum				
Set No.	Ref. No.	Set Consists of:		Net lbs Per Set
*37001	A-A	4 #36001, 4 #36002, 2 #36003		4
37002	B-A	2 #36001, 2 #36002, 1 #36003		2
37003	C-A	2 #36001, 2 #36002		1
* Set #37001 only furnished with the wooden holder as shown				



Black Finish



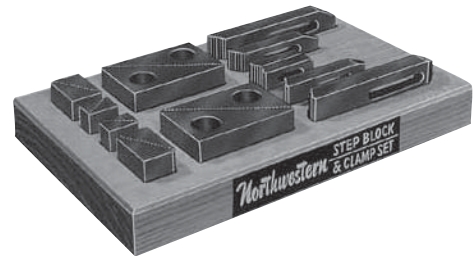
6061-T6 Aluminum

When using step blocks with clamps, be certain that clamp teeth are fully engaged with teeth on step block to prevent damage to block or clamp.

Step Block and Clamp Sets

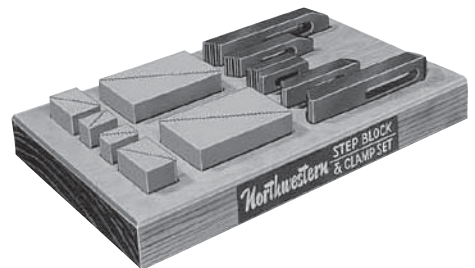
All Steel Blocks and Clamps					
Set No.	Ref. No.	Bolt Size	Set Consists of 2 Each		Net lbs Per Set
			Step Clamps	Step Blocks	
With Standard Blocks 1" Wide					
35101	38BCS	5/16 or 3/8	12101, 12102, 12103	36101, 36102, 36103	11
35102	S12BCS	1/2	12104, 12105, 12106	36101, 36102, 36103	12
35103	S58BCS	5/8	12107, 12108, 12109	36101, 36102, 36103	13
With Heavy Duty Blocks 1-1/2" Wide					
35104	12BCS	1/2	12104, 12105, 12106	36104, 36105, 36106	28
35105	58BCS	5/8	12107, 12108, 12109	36104, 36105, 36106	29
35106	34BCS	3/4	12110, 12111, 12112	36104, 36105, 36106	35
With Double Duty Blocks 2" Wide					
35107	10BCS	7/8 or 1	12113, 12114, 12115	36107, 36108, 36109	62

One Block is Two Pieces,
All Blocks Work with Step Strap Clamps



Sets with clamps for 5/16, 3/8, 1/2, and 5/8 bolts work with metric bolts M8, M10, M12, and M16.

Aluminum Blocks With Steel Clamps					
Set No.	Ref. No.	Bolt Size	Set Consists of 2 Each		Net lbs Per Set
			Step Clamps	Step Blocks	
With Standard Blocks 1" Wide					
35001	38ABCS	5/16 or 3/8	12101, 12102, 12103	36001, 36002, 36003	8
35002	S12ABCS	1/2	12104, 12105, 12106	36001, 36002, 36003	10
35003	S58ABCS	5/8	12107, 12108, 12109	36001, 36002, 36003	11
With Heavy Duty Blocks 1-1/2" Wide					
35004	12ABCS	1/2	12104, 12105, 12106	36004, 36005, 36006	17
35005	58ABCS	5/8	12107, 12108, 12109	36004, 36005, 36006	18
35006	34ABCS	3/4	12110, 12111, 12112	36004, 36005, 36006	24



Clamps for 5/16, 3/8, 1/2, and 5/8 bolts work with metric bolts M8, M10, M12, and M16

Step clamp teeth match all sizes of step blocks, steel or aluminum. Teeth lock securely and permit height adjustments of 1/8" increments.

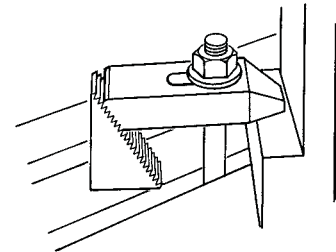
When using step blocks with clamps, be certain that clamp teeth are fully engaged with teeth on step block to prevent damage to block or clamp.

Strap Clamps

Step Clamps						
Part No.	Ref. No.	Bolt Size	Length	Width	Thickness	Net lbs Per 100
12101	25-S38	5/16 or 3/8	2-1/2	1	1/2	23
12102	40-S38	5/16 or 3/8	4	1	5/8	49
12103	60-S38	5/16 or 3/8	6	1-1/8	3/4	107
12104	25-S12	1/2	2-1/2	1-1/8	1/2	25
12105	40-S12	1/2	4	1-1/4	3/4	70
12106	60-S12	1/2	6	1-1/4	7/8	132
12107	25-S58	5/8	2-1/2	1-1/4	5/8	35
12108	40-S58	5/8	4	1-1/2	3/4	84
12109	60-S58	5/8	6	1-1/2	7/8	157
12110	40-S34	3/4	4	1-1/2	3/4	81
12111	60-S34	3/4	6	1-5/8	1	187
12112	80-S34	3/4	8	1-3/4	1-1/8	330
12113	60-S10	7/8 or 1	6	2	1-1/4	274
12114	80-S10	7/8 or 1	8	2	1-3/8	443
12115	10-S10	7/8 or 1	10	2	1-1/2	615



Heat Treated Steel
Black Oxide Finish

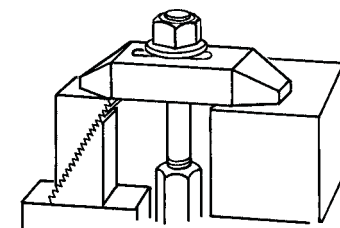


Use with two step block halves for higher clamping requirements.

Plain Clamps						
Part No.	Ref. No.	Bolt Size	Length	Width	Thickness	Net lbs Per 100
12001	25-P38	5/16 or 3/8	2-1/2	1	1/2	22
12002	40-P38	5/16 or 3/8	4	1	5/8	47
12003	60-P38	5/16 or 3/8	6	1-1/8	3/4	103
12004	25-P12	1/2	2-1/2	1-1/8	1/2	24
12005	40-P12	1/2	4	1-1/4	3/4	67
12006	60-P12	1/2	6	1-1/4	7/8	128
12007	25-P58	5/8	2-1/2	1-1/4	5/8	34
12008	40-P58	5/8	4	1-1/2	3/4	83
12009	60-P58	5/8	6	1-1/2	7/8	153
12010	40-P34	3/4	4	1-1/2	3/4	79
12011	60-P34	3/4	6	1-5/8	1	187
12012	80-P34	3/4	8	1-3/4	1-1/8	323
12013	60-P10	7/8 or 1	6	2	1-1/4	270
12014	80-P10	7/8 or 1	8	2	1-3/8	445
12015	10-P10	7/8 or 1	10	2	1-1/2	607



Heat Treated Steel
Black Oxide Finish



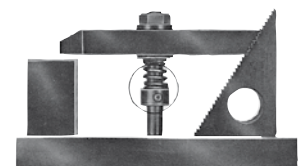
Clamps for 5/16, 3/8, 1/2, and 5/8 bolts work with metric bolts M8, M10, M12, and M16

Clamp Supports

Part No.	Stud Size	Top O.D.	Bottom O.D.	Free Length	Net lbs Per 100
51003	3/8	5/8	7/8	1-1/16	7
51005	1/2	3/4	1	1-1/8	8
51006	5/8	1	1-1/8	1-1/4	11
51007	3/4	1-1/8	1-1/4	1-3/8	14

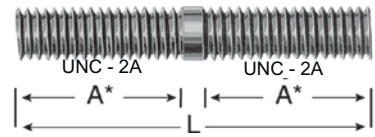


Black Oxide Finish



Holds clamp in place while loading and unloading workpiece.

Clamping Studs



Black Oxide Finish

Material to ASTM A311 Class B
HIGH TENSILE STRENGTH

** Thread Lengths vary due to overall length of stud.

Studs too short for given lengths are threaded as close to center as practical.

Metric Available, Page 46

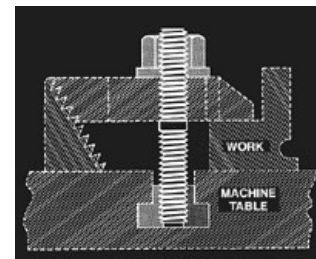


Table Clamping- The stud locks in the heavy part of the Northwestern T-Slot Nut. This prevents damage to the nut and also to the machine table.

Thread Size								
Length L	1/4-20 Part No.	5/16-18 Part No.	3/8-16 Part No.	1/2-13 Part No.	5/8-11 Part No.	3/4-10 Part No.	7/8-9 Part No.	1-8 Part No.
Standard Lengths								
	A 1"	A 1-1/8"	A 1-1/4"	A 1-1/2"	A 1-3/4"	A 2"	A 2-1/4"	A 2-1/2"
1-1/2"	38001 **	38101 **	38201 **	38401 **	38501 **			
2"	* 38002 **	* 38102 **	* 38202 **	* 38402 **	38502 **			
2-1/2"	* 38003	* 38103	* 38203 **	* 38403 **	38503 **			
3"	* 38004	* 38104	* 38204	* 38404 **	* 38504 **	38601 **	38701 **	38801**
3-1/2"	* 38005	* 38105	* 38205	* 38405	* 38505 **	* 38602 **		
4"	38006	38106	* 38206	* 38406	* 38506 **	* 38603 **	38703 **	38803**
4-1/2"		38107	* 38207	* 38407	* 38507	* 38604 **		
5"		38108	* 38208	* 38408	* 38508	* 38605	38705 **	38805**
5-1/2"			* 38209	38409	* 38509	* 38606		
6"		38110	* 38210	38410	* 38510	* 38607	38707	38807
6-1/2"			38211	38411	* 38511	* 38608		
7"		38112	38212	38412	* 38512	* 38609	38709	38809
7-1/2"			38213	38413	* 38513	* 38610		
8"		38114	38214	38414	* 38514	* 38611	38711	38811
Long Lengths								
				A 2"	A 2"	A 2"	A 2-1/4"	A 2-1/2"
9"				38415	38515	38612	38712	38812
10"				38416	38516	38613	38713	38813
12"				38417	38517	38614	38714	38814
14"				38418	38518	38615	38715	38815
16"						38616	38716	38816
18"						38617	38717	38817
20"						38618	38718	38818

*Conform to TCMAI Standards.



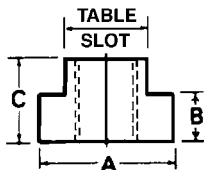
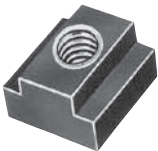
T-Slot Nuts

Machined to exact tolerances to give maximum bearing surface in the table slot

To keep from damaging the T-Nut, the mating thread must be threaded as far as possible into the T-Nut.

These can also be ordered tapped thru.

Standard T-Slot Nuts have an incomplete thread in the base to eliminate any danger of screwing the stud through the nut and damaging the table slot.



Heat Treated Steel
Black Oxide Finish

Stainless Steel T-Slot Nuts available on page 55

All parts conform to TCMAI Standards.

Ask for quoted price on 500 or more.

Part Number	Table Slot	Thread Size	A	B	C	Length	Net lbs Per 100	
								Standard
47017	47017T	5/16	1/4-20	9/16	3/16	1/4	9/16	2
47018	47018T	3/8	1/4-20	9/16	15/64	3/8	9/16	3
47001	47001T	3/8	5/16-18	5/8	3/16	1/2	7/8	5
47019	47019T	7/16	5/16-18	11/16	7/32	1/2	7/8	6
47020	47020T	1/2	5/16-18	7/8	9/32	1/2	7/8	8
47002	47002T	7/16	3/8-16	11/16	7/32	1/2	7/8	5-1/2
47003	47003T	1/2	3/8-16	7/8	9/32	1/2	7/8	7-1/2
47004	47004T	9/16	3/8-16	7/8	11/32	5/8	1-1/8	13
47021	47021T	1/2	7/16-14	7/8	9/32	1/2	7/8	9
47022	47022T	1/2	7/16-14	3/4	7/32	3/8	7/8	8
47005	47005T	9/16	1/2-13	7/8	11/32	5/8	1-1/8	12
47006	47006T	5/8	1/2-13	1	11/32	5/8	1-1/8	14
47023	47023T	5/8	1/2-13	1-1/8	3/8	3/4	1-1/8	17
47007	47007T	11/16	1/2-13	1-1/8	7/16	3/4	1-1/4	22
47024	47024T	3/4	1/2-13	1-1/4	15/32	3/4	1-1/4	24
47008	47008T	11/16	5/8-11	1-1/8	7/16	3/4	1-1/4	20
47009	47009T	3/4	5/8-11	1-1/4	15/32	3/4	1-1/4	23
47010	47010T	13/16	5/8-11	1-1/4	9/16	1	1-1/2	38
47011	47011T	13/16	3/4-10	1-1/4	9/16	1	1-1/2	34
47012	47012T	7/8	3/4-10	1-1/2	9/16	1	1-1/2	42
47013	47013T	1	3/4-10	1-5/8	5/8	1	1-3/4	59
47025	47025T	1	3/4-10	1-3/4	3/4	1-3/4	1-3/4	86
47015	47015T	1-1/16	3/4-10	1-5/8	11/16	1-1/8	2	54
47014	47014T	1	7/8-9	1-5/8	5/8	1	1-3/4	79
47026	47026T	1-1/16	7/8-9	1 5/8	11/16	1 1/8	2	72
47027	47027T	1-1/8	7/8-9	1 3/4	3/4	1 1/2	2	98
47028	47028T	1-5/16	7/8-9	2	15/16	1 1/4	2	131
47016	47016T	1-1/16	1-8	1-5/8	11/16	1-1/8	2	69
47029	47029T	1-1/8	1-8	1 3/4	3/4	1 1/2	2	91
47030	47030T	1-1/4	1-8	2	7/8	1 1/4	2	231
47031	47031T	1-5/16	1-8	2	15/16	1 1/4	2	150
47032	47032T	1-3/8	1 1/4-7	2 1/2	1 1/8	1 3/4	2 1/2	204

Nuts

Flange Nuts							
Part No.	Ref. No.	Thread Size	A	B	C	D	Net lbs Per 100
Unified Coarse							
* 15001	14-FN	1/4-20	5/8	1/2	5/16	3/32	2
* 15002	56-FN	5/16-18	3/4	9/16	3/8	3/32	3
* 15003	38-FN	3/8-16	7/8	11/16	1/2	1/8	5-1/2
15004	76-FN	7/16-14	1	3/4	9/16	5/32	7-1/2
* 15005	12-FN	1/2-13	1-1/8	7/8	11/16	5/32	12
* 15006	58-FN	5/8-11	1-3/8	1-1/16	13/16	3/16	20
* 15007	34-FN	3/4-10	1-5/8	1-1/4	1	1/4	34
* 15008	78-FN	7/8-9	1-3/4	1-7/16	1-1/8	1/4	45
* 15009	10-FN	1-8	2	1-5/8	1-1/4	1/4	64
15009A		1-8	2	1-1/2	1-1/4	1/4	53
15011		1-1/4-7	2-1/4	1-7/8	1-1/4	1/4	74
Unified Fine							
15101	14-NFN	1/4-28	5/8	1/2	5/16	3/32	2
15102	56-NFN	5/16-24	3/4	9/16	3/8	3/32	3
15103	38-NFN	3/8-24	7/8	11/16	1/2	1/8	5-1/2
15104	76-NFN	7/16-20	1	3/4	9/16	5/32	7
15105	12-NFN	1/2-20	1-1/8	7/8	11/16	5/32	11
15106	58-NFN	5/8-18	1-3/8	1-1/16	13/16	3/16	19
15107	34-NFN	3/4-16	1-5/8	1-1/4	1	1/4	33
15108	78-NFN	7/8-14	1-3/4	1-7/16	1-1/8	1/4	40
15109	10-NFN	1-14	2	1-5/8	1-1/4	1/4	62
Spherical							
* 15201	14-SFN	1/4-20	5/8	1/2	5/16	3/32	2-1/2
* 15202	56-SFN	5/16-18	3/4	9/16	3/8	3/32	3-1/2
* 15203	38-SFN	3/8-16	7/8	11/16	1/2	1/8	6
15204	76-SFN	7/16-14	1	3/4	9/16	5/32	8
* 15205	12-SFN	1/2-13	1-1/8	7/8	11/16	5/32	13
* 15206	58-SFN	5/8-11	1-3/8	1-1/16	13/16	3/16	22
* 15207	34-SFN	3/4-10	1-5/8	1-1/4	1	1/4	36
* 15208	78-SFN	7/8-9	1-3/4	1-7/16	1-1/8	1/4	45
* 15209	10-SFN	1-8	2	1-5/8	1-1/4	1/4	68
Toggle Type							
15303	38-TFN	3/8-16	7/8	11/16	1/2	7/32	5
15305	12-TFN	1/2-13	1-1/8	7/8	11/16	1/4	11
15306	58-TFN	5/8-11	1-3/8	1-1/16	13/16	9/32	19
15307	34-TFN	3/4-10	1-5/8	1-1/4	1	3/8	33

* Conform to TCMAI Standards

Larger Sizes Available on Request.

Spherical Nut & Washer Assembly

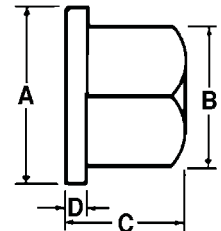
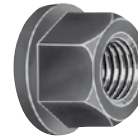
Assembly Consists of:				
Assembly No.	Thread Size	Spherical Flange Nut No.	Spherical Washer Lower Half Only	Net lbs Per 100
15401	1/4-20	15201	32001F	2-1/2
15402	5/16-18	15202	32002F	4
15403	3/8-16	15203	32003F	7
15404	7/16-14	15204	32004F	11
15405	1/2-13	15205	32005F	16
15406	5/8-11	15206	32006F	26
15407	3/4-10	15207	32007F	44
15408	7/8-9	15208	32008F	56
15409	1-8	15209	32009F	81

* Conform to TCMAI Standards

Flange provides large bearing surface and lessens possible damage to part being clamped. Heat treated for long life under repeated usage.

Stainless Steel Available, Page 54

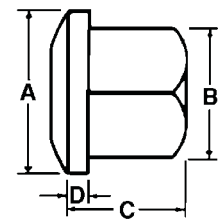
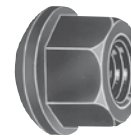
Flange Type



Heat Treated Steel
Black Oxide Finish

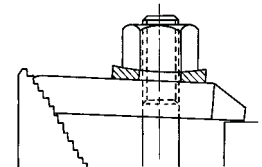
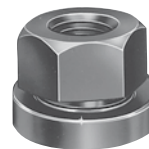
Metric Available, Page 46

Spherical Type (use with spherical washers, see page 63)



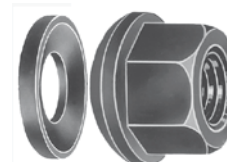
Heat Treated Steel
Black Oxide Finish

Toggle Type



The concave-convex surfaces of this nut and washer assembly allow adjustments to 1-1/2" in all directions. This helps correct misaligned undue stress on threaded members.

Radiused surfaces of this assembly adjust to correct misaligned parts and to eliminate undue stress on threaded members.

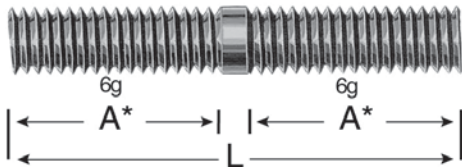


Heat Treated Steel
Black Oxide Finish

Clamping & Set Up

Coupling Nuts

Part No.	Ref. No.	Thread Size	Hex Size	Length	Net lbs Per 100
13001	14-CN	1/4-20	1/2	5/8	3
13002	56-CN	5/16-18	9/16	7/8	5
* 13003	38-CN	3/8-16	11/16	1	9
13004	76-CN	7/16-14	3/4	1-1/4	13
* 13005	12-CN	1/2-13	7/8	1-1/4	18
* 13006	58-CN	5/8-11	1-1/16	1-5/8	33
* 13007	34-CN	3/4-10	1-1/4	1-7/8	52
13008	78-CN	7/8-9	1-7/16	2-1/4	81
13009	10-CN	1-8	1-5/8	2-1/2	114
13011	1-1/4-7	1-7/8	3	164	



Black Oxide Finish

Material to ASTM A311 Class B
HIGH TENSILE STRENGTH

* Studs too short for given thread lengths are threaded as close to center as practical.

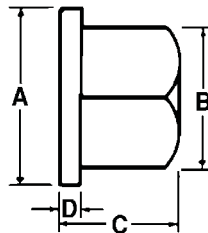
Metric Clamping Studs

Length L	Thread Size			
	M8 x 1.25 Part No.	M10 x 1.5 Part No.	M12 x 1.75 Part No.	M16 x 2.0 Part No.
	A - 31 mm	A - 35 mm	A - 39 mm	A - 47 mm
50 mm	38154			
65 mm	38156	38254		
80 mm	38158	38256	38454	38554
95 mm	38160	38258	38456	
110 mm	38162	38260	38458	38556
125 mm	38164	38262	38460	38558
150 mm		38264	38462	38560
175 mm			38464	38562
200 mm				38564

Inch Available, Page 44



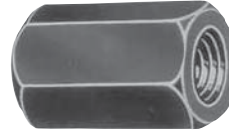
Heat Treated Steel
Black Oxide Finish



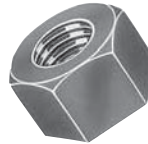
Metric Coupling Nuts

Part No.	Thread Size	Hex A.F.	Length (mm)
13554	M8 x 1.25	14.3	22
13556	M10 x 1.5	17.4	25
13558	M12 x 1.75	22.2	32
13560	M16 x 2.0	27	41

Couple two or more studs together to create stud of any length needed.



Heat Treated Steel
Black Oxide Finish



A precision machined, heavy duty nut. Heat treated to provide maximum durability during repetitive operations. Washer face prevents corners from digging in.

Heavy Nuts

Part No.	Ref. No.	Thread Size	Hex Size	Length	Net lbs Per 100
* 18001	14-HN	1/4-20	1/2	15/64	1-1/2
* 18002	56-HN	5/16-18	9/16	19/64	2
* 18003	38-HN	3/8-16	11/16	23/64	3-1/2
18004	76-HN	7/16-14	3/4	27/64	4
* 18005	12-HN	1/2-13	7/8	31/64	7
* 18006	58-HN	5/8-11	1-1/16	39/64	12
* 18007	34-HN	3/4-10	1-1/4	47/64	20
* 18008	78-HN	7/8-9	1-7/16	55/64	29
* 18009	10-HN	1-8	1-5/8	63/64	40
18011		1-1/4-7	1-7/8	1-7/32	66

* Conform to TCMAI Standards

Metric

Flange Nuts

Part No.	Thread	A	B	C	D
15554	M8 x 1.25	19	14.3	9.5	2.4
15556	M10 x 1.5	22.2	17.4	12.7	3.2
15558	M12 x 1.75	28.5	22.2	17.4	4
15560	M16 x 2.0	35	27	20.6	4.7

All Dimensions in Millimeters

Inch Available, Page 45
Stainless Steel Available, Page 54

Low Profile Toe Clamps

Standard Toe Clamps (Slotted for 1/2 or 5/8 SHCS)

Powerful clamps that grip on the side of the work leaving the top surface open.

Hardened for maximum wear.

PLEASE NOTE:

Clamps slotted for 1/2" SHCS will accept M12 SHCS.

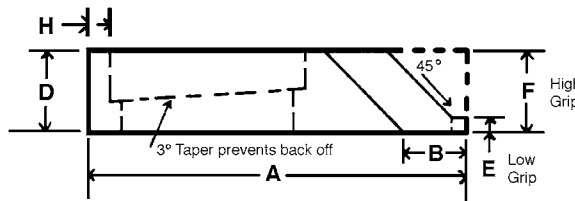
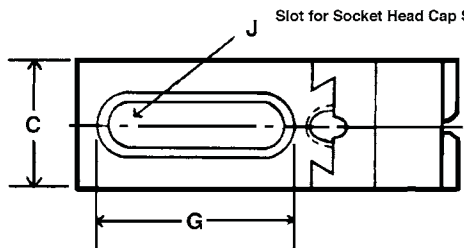
Clamps slotted for 5/8" SHCS will accept M16 SHCS.

Each clamp is furnished with a protective washer.

Part No.		Low Grip Steel Toes								
Slotted For 1/2" SHCS	Slotted For 5/8" SHCS	A	B	C	D	E	F	G	H	J
* 41001	41051	4-1/16	13/16	1-1/2	7/8	1/4		2	1/8	1/2 or 5/8
* 41002	41052	5-1/2	13/16	1-1/2	7/8	1/4		2-3/4	1/2	1/2 or 5/8
* 41003	41053	7-7/16	13/16	1-1/2	7/8	1/4		3-3/4	1	1/2 or 5/8
Part No.		Low Grip Brass Toes								
Slotted For 1/2" SHCS	Slotted For 5/8" SHCS	A	B	C	D	E	F	G	H	J
41031	41081	4-1/16	13/16	1-1/2	7/8	1/4		2	1/8	1/2 or 5/8
41032	41082	5-1/2	13/16	1-1/2	7/8	1/4		2-3/4	1/2	1/2 or 5/8
41033	41083	7-7/16	13/16	1-1/2	7/8	1/4		3-3/4	1	1/2 or 5/8
Part No.		High Grip Steel Toes								
Slotted For 1/2" SHCS	Slotted For 5/8" SHCS	A	B	C	D	E	F	G	H	J
* 41010	41061	4-1/16	13/16	1-1/2	7/8		7/8	2	1/8	1/2 or 5/8
* 41011	41062	5-1/2	13/16	1-1/2	7/8		7/8	2-3/4	1/2	1/2 or 5/8
* 41012	41063	7-7/16	13/16	1-1/2	7/8		7/8	3-3/4	1	1/2 or 5/8
Part No.		High Grip Brass Toes								
Slotted For 1/2" SHCS	Slotted For 5/8" SHCS	A	B	C	D	E	F	G	H	J
41021	41071	4-1/16	13/16	1-1/2	7/8		7/8	2	1/8	1/2 or 5/8
41022	41072	5-1/2	13/16	1-1/2	7/8		7/8	2-3/4	1/2	1/2 or 5/8
41023	41073	7-7/16	13/16	1-1/2	7/8		7/8	3-3/4	1	1/2 or 5/8



Black Oxide Finish



Small Toe Clamps can be anchored with 5/16" or M8 SHCS.

Small Toe Clamps (Slotted for 5/16 or M8 SHCS)

Part No.		Low Grip								
Steel Toe	Brass Toe	A	B	C	D	E	F	G	H	J
* 41101	41131	2	1/2	1	5/8	1/8		3/4	1/16	5/16 & M8
* 41102	41132	2-1/2	1/2	1	5/8	1/8		1-1/4	1/16	5/16 & M8
* 41103	41133	3	1/2	1	5/8	1/8		1-3/4	1/16	5/16 & M8
Part No.		High Grip								
Steel Toe	Brass Toe	A	B	C	D	E	F	G	H	J
* 41110	41121	2	1/2	1	5/8		5/8	3/4	1/16	5/16 & M8
* 41111	41122	2-1/2	1/2	1	5/8		5/8	1-1/4	1/16	5/16 & M8
* 41112	41123	3	1/2	1	5/8		5/8	1-3/4	1/16	5/16 & M8

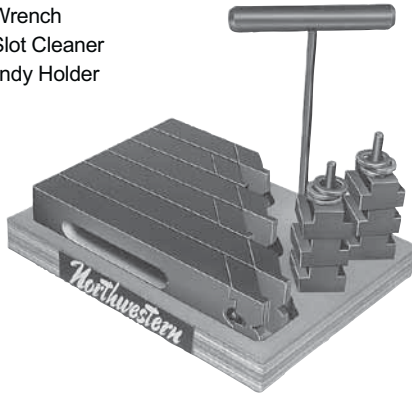
* Conform to TCMAI Standards

Clamping & Set Up

Toe Clamp Nut dimensions given below.

Each Kit contains:

- 6 Toe Clamps -2 of each length with Low Grip Steel Toe
- 6 Toe Clamp Nuts - to fit your machine
- 6 Washers
- 1 T-Wrench
- 1 T-Slot Cleaner
- 1 Handy Holder



Toe Clamp Accessories

Toes Only

Toes Only for Standard Clamps

Interchangeable on any length

Part No.	Description
41301	Low Grip Steel Toe
41305	High Grip Steel Toe
41307	High Grip Brass Toe
41309	Low Grip Brass Toe

Toes Only for Small Clamps

Interchangeable on any length

41302	Low Grip Steel Toe
41306	High Grip Steel Toe
41308	High Grip Brass Toe
41310	Low Grip Brass Toe

Toe Clamp Nuts

Part No.	Table Slot	A	B	C	Length	Net lbs Per 100
For Standard Clamps - 1/2-13 Threads						
42001	9/16	7/8	11/32	5/8	1-1/8	12
42002	5/8	1	11/32	5/8	1-1/8	14
42003	11/16	1-1/8	7/16	3/4	1-1/4	21
42004	13/16	1-1/4	9/16	1	1-1/2	41
42005	7/8	1-1/2	9/16	1	1-1/2	48
42006	1	1-5/8	5/8	1	1-3/4	65
For Standard Clamps - 5/8-11 Threads						
42007	11/16	1-1/8	7/16	3/4	1-1/4	20
42008	3/4	1-1/4	15/32	3/4	1-1/4	23
42009	13/16	1-1/4	9/16	1	1-1/2	38
For Small Clamps - 5/16-18 Threads						
42010	3/8	5/8	3/16	3/8	7/8	4
42011	7/16	11/16	7/32	3/8	7/8	5
42012	1/2	7/8	7/32	3/8	7/8	6
42013	9/16	7/8	9/32	1/2	1	10
42014	5/8	1	9/32	1/2	1	11

Toe Clamp Kits

Kit No.	Table Slot	Toe Clamps 2 Each	Toe Clamp Nuts 6 Ea	Washers 6 Ea	T-Wrench 1 Each	Net lbs Per Kit
Standard Toe Clamp Kits (Slotted for 1/2" or M12 SHCS)						
41501	9/16	41001, 41002, 41003	42001	42501	43001	11
41502	5/8	41001, 41002, 41003	42002	42501	43001	12
41503	11/16	41001, 41002, 41003	42003	42501	43001	12
41504	13/16	41001, 41002, 41003	42004	42501	43001	13
41505	7/8	41001, 41002, 41003	42005	42501	43001	14
41506	1	41001, 41002, 41003	42006	42501	43001	15
(Slotted for 5/8" or M16 SHCS)						
41507	11/16	41051, 41052, 41053	42007	42503	43001	15
41508	3/4	41051, 41052, 41053	42008	42503	43001	15
41509	13/16	41051, 41052, 41053	42009	42503	43001	15
Small Toe Clamp Kits (Slotted for 5/16" or M8 SHCS)						
41510	3/8	41101, 41102, 41103	42010	42502	43002	3
41511	7/16	41101, 41102, 41103	42011	42502	43002	3
41512	1/2	41101, 41102, 41103	42012	42502	43002	3
41513	9/16	41101, 41102, 41103	42013	42502	43002	3
41514	5/8	41101, 41102, 41103	42014	42502	43002	3

Add some Toes to your kit, see selections below.

Replacement Parts

For Standard Clamps

Part No.	Description	Net lbs Per 100
41201	Actuating Screw	2-1/2
42501	For 1/2" or M12 Slot Clamp Washer	1
42503	For 5/8" or M16 Slot Clamp Washer	1

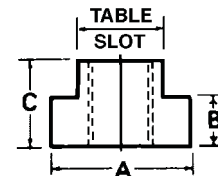
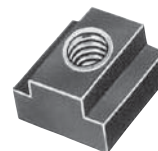
For Small Clamps

41202	Actuating Screw	1/4
42502	Clamp Washer	1

Actuating Screw Wrenches

Part No.	Net lbs Per 100
T-Wrench - For Standard Clamps	
43001	42
T-Wrench - For Small Clamps	
43002	5

These T-Nuts are tapped thru so the toe clamp will be solidly anchored under any condition.

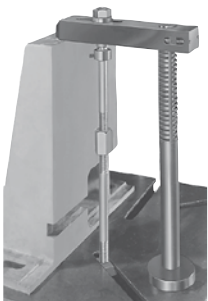


Heat Treated Steel
Black Oxide Finish

Hi-Rise Clamps Sets

Standard Hi-Rise Clamp Sets

Set No.	Stud Size	Table Slot Size	T-Nut Part No.	Net lbs Per Set
50051	3/8-16	7/16	47002	16
50052	3/8-16	1/2	47003	16
50053	3/8-16	9/16	47004	16
50054	1/2-13	9/16	47005	18
50055	1/2-13	5/8	47006	18
50056	1/2-13	11/16	47007	18
50057	5/8-11	11/16	47008	20
50058	5/8-11	3/4	47009	20
50059	5/8-11	13/16	47010	21
50060	3/4-10	13/16	47011	24
50061	3/4-10	7/8	47012	24
50062	3/4-10	1	47013	24
50063	3/4-10	1-1/16	47015	25



Each Kit Contains:

- 2 Studs of each length: 3", 4", 5", 6", 7" & 8"
- 2 T-Slot Nuts to fit your machine
- 2 Toggle Flange Nuts
- 4 Coupling Nuts
- 2 Standard Length Hi-Rise Clamps
- 2 Slotted Racks 6" long
- 2 Extensions, 4" long
- 2 Extensions, 6-1/2" long
- 2 Aluminum Bases
- 2 Clamp Supports
- 1 T-Slot Cleaner
- 1 Handy Holder

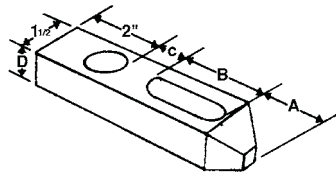
A 1/4 turn of the clamp disengages the tangs from the slots in the rack allowing the clamp to move up and down.

Adding extensions to the rack gives an unlimited clamping range.

Hi-Rise Clamp Accessories

Hi-Rise Clamps

Part No.	Style	Stud Size	A	B	C	D	Net lbs Per 100
50101	Standard	3/8	3/4	2	3/4	7/8	142
50102	Long Reach	3/8	1-1/8	3	1-3/8	7/8	201
50103	Standard	1/2	3/4	2	3/4	7/8	136
50104	Long Reach	1/2	1-1/8	3	1-3/8	7/8	196
50105	Standard	5/8	3/4	2	3/4	7/8	131
50106	Long Reach	5/8	1-1/8	3-1/2	1-7/8	1-1/8	281
50107	Standard	3/4	3/4	2	3/4	7/8	126
50108	Long Reach	3/4	1-1/8	3-1/2	1-7/8	1-1/8	269



Clamp slides up or down the slotted rack for fast height adjustment.

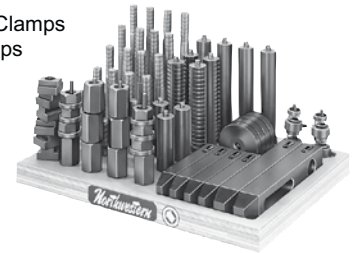
In addition to the standard components shown in this catalog, special sizes can also be furnished. Send print or drawing for quotation.

Super Hi-Rise Clamp Sets

Set No.	Stud Size	Table Slot Size	T-Nut Part No.	Net lbs Per Set
50001	3/8-16	7/16	47002	40
50002	3/8-16	1/2	47003	40
50003	3/8-16	9/16	47004	40
50004	1/2-13	9/16	47005	44
50005	1/2-13	5/8	47006	44
50006	1/2-13	11/16	47007	44
50007	5/8-11	11/16	47008	49
50008	5/8-11	3/4	47009	49
50009	5/8-11	13/16	47010	50
50010	3/4-10	13/16	47011	57
50011	3/4-10	7/8	47012	57
50012	3/4-10	1	47013	58
50013	3/4-10	1-1/16	47015	59

Each Kit Contains:

- 4 Studs of each length: 3", 4", 5", 6", 7" & 8"
- 6 T-Slot Nuts to fit your machine
- 6 Toggle Flange Nuts
- 8 Coupling Nuts
- 4 Standard Length Hi-Rise Clamps
- 2 Long Reach Hi-Rise Clamps
- 4 Extensions, 4" long
- 4 Extensions, 6-1/2" long
- 4 Aluminum Bases
- 4 Clamp Supports
- 1 T-Slot Cleaner
- 1 Handy Holder



PATENT NO. 3,623,718

Racks and clamps are hardened to prevent wear.

Solid Extensions

Part No.	Length	Diam.	Net lbs/100
50301	4	1	87
50302	6-1/2	1	142



Add to the slotted rack for higher requirements.

Black Oxide Finish

Aluminum Base

Part No.	Diam.	Height	Net lbs/100
50401	2-1/2	5/8	28



Provides solid support and protects tables.

Black Anodize

Slotted Rack

Part No.	Length	Diam.	Net lbs/100
50201	6	1	115



Heat Treated Alloy Steel
Black Oxide Finish

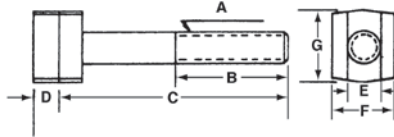
Slots let clamp adjust within 1/16" of work height.

Used for setting up work on planers, shapers, milling machines or similar applications. Heads sized to fit in table slot giving more bearing surface. Cannot twist or jam in slot. Upset forged from AISI 1045 for strength. Unified Coarse Threads.

Stainless Steel Available, Page 57



Black Oxide Finish



T-Slot Bolts

Part No.	A	B	C	D	E	F	G	Net lbs Per 100	Use Flange Nut Order Separately
52201	3/8-16	5/8	1	13/64	3/8	5/8	3/4	7	15003
52203	3/8-16	1	1-1/2	13/64	3/8	5/8	3/4	8	15003
52205	3/8-16	1-1/4	2	13/64	3/8	5/8	3/4	9	15003
52207	3/8-16	1-1/2	2-1/2	13/64	3/8	5/8	3/4	11	15003
52209	3/8-16	1-1/2	3	13/64	3/8	5/8	3/4	12	15003
52211	3/8-16	1-1/2	3-1/2	13/64	3/8	5/8	3/4	14	15003
52213	3/8-16	1-1/2	4	13/64	3/8	5/8	3/4	15	15003
52403	1/2-13	1	1-1/2	1/4	1/2	13/16	1	14	15005
52405	1/2-13	1-1/4	2	1/4	1/2	13/16	1	17	15005
52407	1/2-13	1-1/2	2-1/2	1/4	1/2	13/16	1	19	15005
52409	1/2-13	1-1/2	3	1/4	1/2	13/16	1	22	15005
52411	1/2-13	1-1/2	3-1/2	1/4	1/2	13/16	1	24	15005
52413	1/2-13	1-1/2	4	1/4	1/2	13/16	1	27	15005
52415	1/2-13	1-1/2	5	1/4	1/2	13/16	1	33	15005
52417	1/2-13	2	6	1/4	1/2	13/16	1	37	15005
52503	5/8-11	1	1-1/2	5/16	5/8	1-1/64	1-1/8	23	15006
52505	5/8-11	1-1/4	2	5/16	5/8	1-1/64	1-1/8	28	15006
52507	5/8-11	1-1/2	2-1/2	5/16	5/8	1-1/64	1-1/8	32	15006
52509	5/8-11	1-1/2	3	5/16	5/8	1-1/64	1-1/8	36	15006
52511	5/8-11	1-1/2	3-1/2	5/16	5/8	1-1/64	1-1/8	40	15006
52513	5/8-11	1-1/2	4	5/16	5/8	1-1/64	1-1/8	44	15006
52515	5/8-11	1-1/2	5	5/16	5/8	1-1/64	1-1/8	52	15006
52517	5/8-11	2	6	5/16	5/8	1-1/64	1-1/8	61	15006
52519	5/8-11	3	8	5/16	5/8	1-1/64	1-1/8	74	15006
52609	3/4-10	1-1/2	3	3/8	3/4	1-1/4	1-3/8	56	15007
52611	3/4-10	1-1/2	3-1/2	3/8	3/4	1-1/4	1-3/8	62	15007
52613	3/4-10	1-1/2	4	3/8	3/4	1-1/4	1-3/8	68	15007
52615	3/4-10	1-1/2	5	3/8	3/4	1-1/4	1-3/8	80	15007
52617	3/4-10	2	6	3/8	3/4	1-1/4	1-3/8	95	15007
52619	3/4-10	3	8	3/8	3/4	1-1/4	1-3/8	113	15007
52813	1-8	2	4	1/2	1	1-21/32	1-7/8	135	15009
52815	1-8	2	5	1/2	1	1-21/32	1-7/8	159	15009
52817	1-8	2	6	1/2	1	1-21/32	1-7/8	180	15009
52819	1-8	3	8	1/2	1	1-21/32	1-7/8	221	15009
52821	1-8	3	10	1/2	1	1-21/32	1-7/8	264	15009

T-Slot Bolt and Stud Sets

Set No.	Thread Size	Table Slot	Set Includes - 4 Each		Clamping Range	Net lbs Per Set
			T-Slot Bolts	Studs		
53003	3/8-16	3/8	1-1/2, 2, 2-1/2, 3, 4	4	1/2 to 7	6
53005	1/2-13	1/2	2, 3, 4, 5, 6	5	1 to 9	10
* 53006	5/8-11	5/8	3, 4, 5, 6, 8	6	1 to 13	18
53007	3/4-10	3/4	3, 4, 5, 6, 8	7	1 to 14	27
53009	1-8	1	4, 5, 6, 8, 10	8	1-1/2 to 16	57

* SET 53006 fits BRIDGEPORT type milling machines

Each Set Contains:

- 20 T-Slot Bolts - 4 Each of 5 Lengths
- 4 Extension Studs
- 4 Coupling Nuts
- 6 Flange Nuts
- 1 T-Slot Cleaner
- Handy Holder



T-Slot Cleaner

Part No.	Length	Net lbs Per 100
47101	6	16

Eliminates the danger of removing chips with air.

One by each of your machines will be a time and eye saver.



NEW!

Mini Clamps

Fixture Clamps

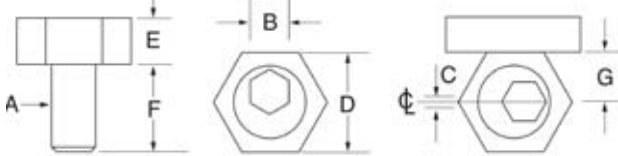
Part Number	A	B	C	D	E	F	G	Torque (ft-lbs)	Holding Force (lbs)	# of Clamps Per Pack
81168	8-32	5/64	.030	.312	.110	.350	.150	1.5	205 lbs	10
81169	10-32	3/32	.040	.500	.160	.340	.250	2.5	350 lbs	10
81170	1/4-20	1/8	.040	.625	.190	.470	.308	6.2	800 lbs	10
81171	5/16-24	3/16	.040	.812	.190	.460	.400	8.3	800 lbs	12
81172	5/16-18	3/16	.040	.812	.190	.460	.400	8.3	800 lbs	12
81173	3/8-16	3/16	.050	.812	.250	.710	.400	20.8	2,000 lbs	10
81174	1/2-13	5/16	.100	1.000	.375	.900	.500	65.0	4,000 lbs	8
81175	5/8-11	3/8	.100	1.187	.500	1.125	.090	100.0	6,000 lbs	4

The Mini Clamp is made up of two simple components: a hardened steel socket cap screw with an offset head and a hexagonal washer.

Low profile makes computer programming easier.

Small size allows more parts per load.

Simple design keeps costs low.



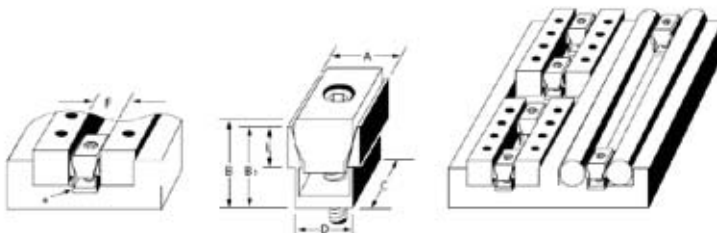
NEW!

Uniforce® Clamps

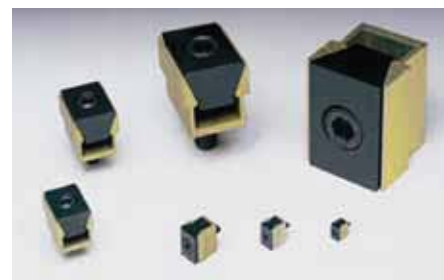
Part Number	Model	A	B	B1	C	D*	E	F**	Thread Size	Max Speed	Torque (ft-lbs)	Holding Force (lbs)	# of Clamps Per Pack	Key Size
81176	250	.240	.27	.250	.320	.210	.140	.250	2-56	5/64	0.5	200	6	5/64
81177	375	.360	.38	.375	.470	.310	.185	.375	4-40	.390	1.1	310	6	3/32
81178	500	.485	.58	.500	.625	.410	.220	.500	8-32	.530	2.5	500	8	9/64
81179	750	.735	.77	.750	.940	.635	.375	.750	1/4-20	.785	10.8	1,500	6	3/16
81180	1000	.980	1.02	1.000	1.250	.820	.500	1.00	5/16-18	1.050	10.4	2,000	4	1/4
81181	1500	1.470	1.52	1.875	1.875	1.215	.750	1.500	1/2-13	1.560	28.3	3,500	2	3/8

D* - A milled slot wider than D dimension will insure clamp remains in line with workpiece. Clamp sides should not come in contact with slot walls during expansion.

F** - The distance needed between workpieces for clamp clearance. Drill and tap mounting hole on the center of F dimension.



The Uniforce® Clamp, a compact, economical work, holding device enables you to fixture more parts on the machine table. This simple, efficient method of clamping work pieces will decrease your set up time and increase your profits and production.



NEW!

Mini Clamps

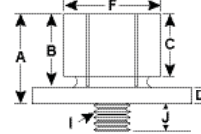
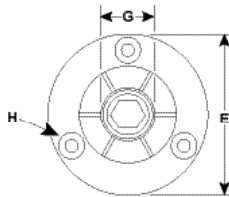
ID Xpansion® Clamps

Part No.		A	B	C	D	E	F	G*	H**	I	Torque J	Holding (ft-lbs)	Force (lbs)
81143	00	.42	.30	.29	.12	.787	.29	.16	2-56 on .540 BHC	2-56	.16	.5	250
81144	0	.86	.63	.59	.23	1.170	.49	.28	6-32 on .825 BHC	8-32	.30	3.6	950
81145	1	.98	.75	.59	.23	1.240	.56	.48	6-32 on .910 BHC	1/4-20	.50	13.3	1,900
81146	2	.98	.75	.59	.23	1.476	.79	.53	6-32 on 1.140 BHC	5/16-18	.56	27.6	2,500
81147	3	1.13	.88	.69	.25	1.968	1.06	.71	8-32 on 1.550 BHC	3/8-16	.71	49.3	4,500
81148	4	1.25	1.00	.81	.25	2.205	1.39	.90	8-32 on 1.790 BHC	1/2-13	.71	120.0	5,900
81149	5	1.56	1.25	1.06	.31	2.736	1.65	1.15	10-32 on 2.200 BHC	5/8-11	.79	224.0	10,000
81150	6	1.79	1.25	1.06	.31	2.972	2.03	1.15	10-32 on 2.515 BHC	5/8-11	.79	224.0	10,000
81151	7	1.79	1.48	1.27	.31	4.232	3.06	1.15	1/4-20 on 3.646 BHC	5/8-11	.79	224.0	10,000
81152	8	1.79	1.48	1.27	.31	5.232	4.06	1.15	1/4-20 on 4.648 BHC	5/8-11	.79	224.0	10,000
81153	9	1.79	1.48	1.27	.31	5.232	6.89	1.15	1/4-20 on 4.648 BHC	5/8-11	.79	224.0	10,000
81154	10	1.79	1.48	1.27	.31	6.000	9.85	1.15	1/4-20 on 5-250 BHC	5/8-11	.79	125.0	6,000

G* - Minimum diameter the "F" dimension can be machined or turned down.
 H** - (3) Mounting Screws included - (4) for 81153 and 81154
 81154 is made from 7075-T6 aluminum

Low Profile

- Ideal for Secondary Operations on Lathe Parts
- Easily Machined to Size on Lathe or Mill
- Excellent for Palletized Setups
- Allows more Parts Per Workcube or fixture plates
- Clamp body made of mild steel for machinability
- Tighten with Hex Key or Hydraulic Pull cylinders



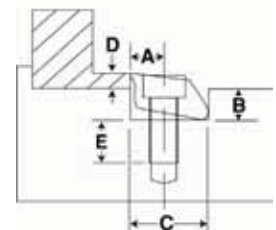
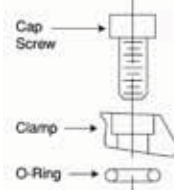
NEW!

Pitbull® Clamps

Part No.	Description	A	B	C	D*	E	Clamp Width	Screw Size	Torque (ft-lbs)	Holding Force (lbs)	Total Throw	No Clamps Per Package
81155	Tool Steel, Knife Edge	.150	.140	.375	.075	.260	.375	4-40	1.30	650	.0075	8
81156	Tool Steel, Blunt Edge	.150	.140	.375	.075	.260	.375	4-40	1.30	650	.0075	8
81157	Brass, Blunt Edge	.150	.140	.375	.075	.220	.375	4-40	.41	200	.0075	8
81158	Tool Steel, Knife Edge	.200	.187	.500	.100	.390	.500	8-32	3.70	1,500	.0160	8
81159	Tool Steel, Blunt Edge	.200	.187	.500	.100	.390	.500	8-32	3.70	1,500	.0160	8
81160	Brass, Blunt Edge	.200	.187	.500	.100	.340	.500	8-32	2.0	400	.0160	8
81161	Tool Steel, Knife Edge	.300	.280	.750	.150	.570	.750	1/4-20	14.50	3,600	.0240	6
81162	Tool Steel, Blunt Edge	.300	.280	.750	.150	.570	.750	1/4-20	14.50	3,600	.0240	6
81163	Brass, Blunt Edge	.300	.280	.750	.150	.440	.750	1/4-20	4.10	950	.0240	6
81164	Tool Steel, Knife Edge	.400	.450	1.000	.250	.710	1.000	3/8-16	30.00	6,000	.0500	4
81165	Tool Steel, Blunt Edge	.400	.450	1.000	.250	.710	1.000	3/8-16	30.00	6,000	.0500	4
81166	Tool Steel, Knife Edge	.600	.640	1.500	.375	.770	1.500	1/2-13	108.30	12,000	.0750	2
81167	Tool Steel, Blunt Edge	.600	.640	1.500	.375	.770	1.500	1/2-13	108.30	12,000	.0750	2

D* - Clamp Height

The Pitbull® Clamp is a revolutionary new fixture clamp with positive down force and a low gripping profile. High vertical and horizontal clamping forces are generated, considering the size of the Pitbull® Clamps. It uses a standard cap screw and an oil resistant O-ring. The Pitbull® Clamp is available in 5 sizes and several styles. A tool steel knife edge for aggressive stock removal, a tool steel blunt edge for general purpose and a brass version to help prevent marring the work piece.





Northwestern

Tools, Inc.
Product Guide for Tooling and Manufacturing



Stainless Steel Components

NEW!

Metric Flange Nuts

Part No.	Thread A	B	C	D	E
81380	M6 x 1.0	12.7	15.9	7.9	2.4
81381	M8 x 1.25	14.3	19	9.5	2.4
81382	M10 x 1.5	17.4	22.2	12.7	3.2
81383	M12 x 1.75	22.2	28.5	17.4	4
81384	M16 x 2.0	27	35	20.6	4.7

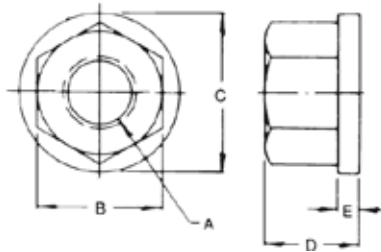
If the size you require is not listed, give us the specifications, we will make it for you.

Flange provides larger bearing surface.

All Dimensions in Millimeters

303 Stainless Steel

Steel Available, Page 45 and 46



Nuts

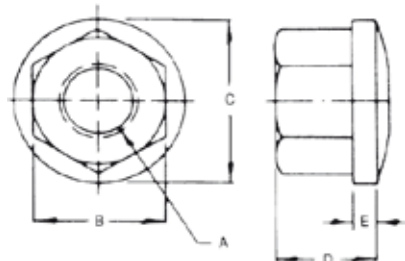
NEW!

Flange Nuts

Part No.	Thread A	B	C	D	E
81359	1/4-20	1/2	5/8	5/16	3/32
81360	1/4-28	1/2	5/8	5/16	3/32
81360A	5/16-18	9/16	3/4	3/8	3/32
81361	5/16-24	9/16	3/4	3/8	3/32
81362	3/8-16	11/16	7/8	1/2	1/8
81363	3/8-24	11/16	7/8	1/2	1/8
81364	7/16-14	3/4	1	9/16	5/32
81365	7/16-20	3/4	1	9/16	5/32
81366	1/2-13	7/8	1-1/8	11/16	5/32
81367	1/2-20	7/8	1-1/8	11/16	5/32
81368	5/8-11	1-1/16	1-3/8	13/16	3/16
81369	5/8-18	1-1/16	1-3/8	13/16	3/16
81370	3/4-10	1-1/4	1-5/8	1	1-1/4
81371	3/4-16	1-1/4	1-5/8	1	1-1/4
81372	7/8-9	1-7/16	1-3/4	1-1/8	1-1/4
81373	7/8-14	1-7/16	1-3/4	1-1/8	1-1/4
81374	1-8	1-5/8	2	1-1/4	1-1/4
81375	1-14	1-5/8	2	1-1/4	1-1/4
81376	1-1/8-7	1-3/4	2-1/4	1-1/4	1-1/4
81377	1-1/8-12	1-3/4	2-1/4	1-1/4	1-1/4
81378	1-1/4-7	1-13/16	2-1/4	1-1/4	1-1/4
81379	1-1/4-12	1-13/16	2-1/4	1-1/4	1-1/4

Spherical Flange Nuts can be used with the bottom half of Northwestern spherical washers for self-alignment, see page 56.

303 Stainless Steel



NEW!

Spherical Flange Nuts

Part No.	Thread A	B	C	D	E
81385	1/4-20	1/2	5/8	5/16	3/32
81386	5/16-18	9/16	3/4	3/8	3/32
81387	3/8-16	11/16	7/8	1/2	1/8
81388	1/2-13	7/8	1-1/8	11/16	5/32
81389	5/8-11	1-1/16	1-3/8	13/16	3/16
81390	3/4-10	1-1/4	1-5/8	1	1/4
81391	7/8-9	1-7/16	1-7/8	1-1/8	1/4
81392	1-8	1-5/8	2	1-1/4	1/4
81393	1-1/8-7	1-13/16	2-1/4	1-1/4	1/4
81394	1-1/4-7	2	2-5/8	1-1/4	1/4

For more information, check out our website:

www.northwesternertools.com

Nuts

NEW!

T-Slot Nuts

Part No.	A	B	C	D	E	F
81265	1/4-20	5/16	1/4	1/2	11/64	9/16
81266	5/16-18	3/8	13/32	5/8	7/32	3/4
81267	5/16-18	7/16	3/8	11/16	1/4	11/16
81268	3/8-16	7/16	1/2	3/4	7/32	1
81269	3/8-16	1/2	5/8	7/8	1/4	7/8
81270	3/8-16	9/16	5/8	7/8	5/16	1-1/4
81271	1/2-13	9/16	3/4	7/8	11/32	1-1/4
81272	1/2-13	9/16	3/4	7/8	5/16	1-1/4
81273	1/2-13	9/16	3/4	1-1/8	25/64	1-1/4
81274	1/2-13	5/8	3/4	1	3/8	1-1/4
81275	1/2-13	5/8	3/4	1-1/8	7/16	1-1/4
81276	1/2-13	11/16	3/4	1-1/8	13/32	1-1/4
81277	5/8-11	11/16	1-1/8	1-1/8	15/32	1-1/4
81278	5/8-11	11/16	1	1-1/4	15/32	1-1/4
81279	5/8-11	13/16	1	1-1/4	17/32	1-1/4
81280	3/4-10	13/16	1-3/8	1-3/8	17/32	1-3/4
81281	3/4-10	13/16	1	1-1/2	9/16	1-3/4
81282	3/4-10	1	1	1-5/8	9/16	1-3/4
81283	3/4-10	1-1/16	1	1-5/8	9/16	1-3/4

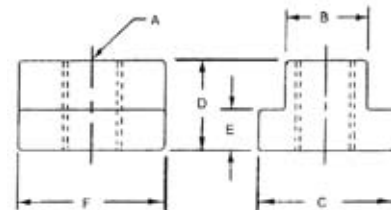
If the size you require is not listed, give us the specifications...
We will make it for you.

Imperfect thread to prevent damage to machine table.

Tapped-thru hole available upon request.

303 Stainless Steel

Steel Available, Page 44



NEW!

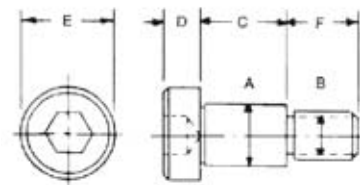
Screws

Socket Head Shoulder Screws

Part No.	+0.000 -0.001 A	B	+0.005 -0.000 C	D	E	F
81284	.250	10-24	3/16	1/4	3/8	3/8
81285	.250	10-24	3/16	3/8	3/8	3/8
81286	.250	10-24	3/16	1/2	3/8	3/8
81287	.250	10-24	3/16	5/8	3/8	3/8
81288	.250	10-24	3/16	3/4	3/8	3/8
81289	.250	10-24	3/16	1	3/8	3/8
81290	.312	1/4-20	7/32	1/4	7/16	7/16
81291	.312	1/4-20	7/32	3/8	7/16	7/16
81292	.312	1/4-20	7/32	1/2	7/16	7/16
81293	.312	1/4-20	7/32	5/8	7/16	7/16
81294	.312	1/4-20	7/32	3/4	7/16	7/16
81295	.312	1/4-20	7/32	1	7/16	7/16
81296	.375	5/16-18	1/4	1/4	9/16	1/2
81297	.375	5/16-18	1/4	3/8	9/16	1/2
81298	.375	5/16-18	1/4	1/2	9/16	1/2
81299	.375	5/16-18	1/4	5/8	9/16	1/2
81300	.375	5/16-18	1/4	3/4	9/16	1/2
81301	.375	5/16-18	1/4	1	9/16	1/2
81302	.500	3/8-16	5/16	3/8	3/4	5/8
81303	.500	3/8-16	5/16	1/2	3/4	5/8
81304	.500	3/8-16	5/16	5/8	3/4	5/8
81305	.500	3/8-16	5/16	3/4	3/4	5/8
81306	.500	3/8-16	5/16	1	3/4	5/8
81307	.625	1/2-13	3/8	1/2	7/8	3/4
81308	.625	1/2-13	3/8	5/8	7/8	3/4
81309	.625	1/2-13	3/8	3/4	7/8	3/4
81310	.625	1/2-13	3/8	1	7/8	3/4

303 Stainless Steel

Steel Available, Page 82



Stainless Steel Components

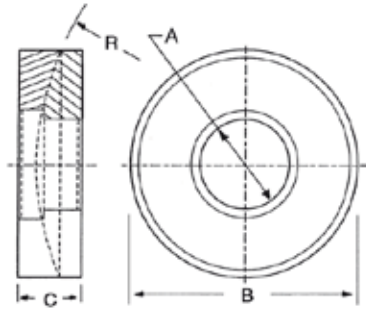
Precisions machined sets

Bottom section works with spherical collar nuts

Tops and bottoms can be ordered separately. Please specify when ordering.

303 Stainless Steel

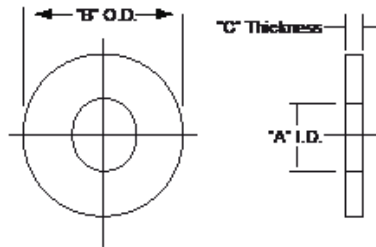
Steel Available, Page 63



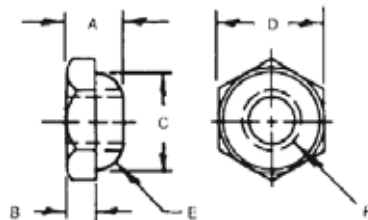
Extra thick for increased strength.

300 Series Stainless Steel

Steel Available, Page 59



Machined from 303 Stainless Steel



Washers

NEW!

Spherical Washers

Part No.	Bolt Size	A	B	C	Radius R
81182	1/4	9/32	5/8	3/16	3/4
81183	5/16	11/32	3/4	1/4	1
81184	3/8	13/32	7/8	1/4	1-1/4
81185	7/16	15/32	1	5/16	1-1/2
81186	1/2	17/32	1-1/8	5/16	1-1/2
81187	5/8	21/32	1-3/8	5/16	1-3/4
81188	3/4	25/32	1-5/8	3/8	2-1/4
81189	7/8	15/16	1-3/4	3/8	2-1/2
81190	1	1-1/16	2	1/2	2-3/4
81191	1-1/8	1-3/16	2-1/4	1/2	3
81192	1-1/4	1-5/16	2-5/8	1/2	3
81193	1-1/2	1-9/16	2-7/8	9/16	3-1/2
81194	1-5/8	1-11/16	3-1/4	11/16	3-1/2
81195	1-3/4	1-13/16	3-1/4	11/16	3-1/2
81196	2	2-1/16	3-7/8	3/4	3-1/2
81197	2-1/4	2-5/16	4-1/2	7/8	4
81198	2-1/2	2-9/16	4-1/2	7/8	4

NEW!

Heavy Duty Stainless Steel Washers

Part No.	Bolt Size	A	B	C
81199	1/4	9/32	5/8	.090
81200	5/16	11/32	11/16	.090
81201	3/8	13/32	13/16	.125
81202	7/16	15/32	59/64	.125
81203	1/2	17/32	1-1/16	.180
81204	9/16	19/32	1-3/16	.180
81205	5/8	21/32	1-5/16	.210
81206	3/4	13/16	1-1/2	.210

NEW!

Stainless Steel Hex Head Equalizing Nuts

Part No.	Thread F	A	B	C	D	E
81207	4-40	1/4	1/8	9/32	5/16	3/32
81208	6-32	1/4	1/8	9/32	5/16	3/32
81209	8-32	1/4	1/8	5/16	3/8	3/32
81210	10-24	5/16	5/32	3/8	7/16	1/8
81211	10-32	5/16	5/32	3/8	7/16	1/8
81212	1/4-20	5/16	5/32	7/16	1/2	1/8
81213	5/16-18	5/16	5/32	1/2	9/16	1/8
81214	3/8-16	3/8	3/16	5/8	11/16	3/16
81215	1/2-13	1/2	1/4	11/16	3/4	1/4

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NEW!

T-Slot Bolts

T-Slot Bolts - Stainless Steel

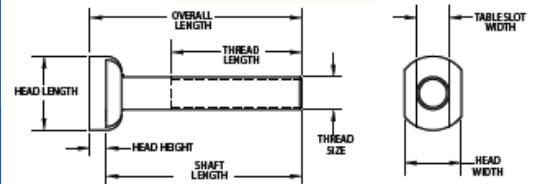
Part No.	Thread	Shaft Length	Table Slot	Thread Length	Height Over	Head Width	Head Length
81117	3/8-16	1	3/8	5/8	3/16	11/16	3/4
81118	3/8-16	1-1/4	3/8	7/8	3/16	11/16	3/4
81119	3/8-16	1-1/2	3/8	1-1/8	3/16	11/16	3/4
81120	3/8-16	2	3/8	1-1/2	3/16	11/16	3/4
81121	3/8-16	2-1/2	3/8	1-1/2	3/16	11/16	3/4
81122	1/2-13	1-1/4	1/2	3/4	9/32	7/8	1-1/8
81123	1/2-13	1-1/2	1/2	1	9/32	7/8	1-1/8
81124	1/2-13	1-3/4	1/2	1-1/4	9/32	7/8	1-1/8
81125	1/2-13	2	1/2	1-1/2	9/32	7/8	1-1/8
81126	1/2-13	2-1/4	1/2	1-1/2	9/32	7/8	1-1/8
81127	1/2-13	2-1/2	1/2	1-1/2	9/32	7/8	1-1/8
81128	1/2-13	3	1/2	1-1/2	9/32	7/8	1-1/8
81129	1/2-13	3-1/2	1/2	2	9/32	7/8	1-1/8
81130	1/2-13	4	1/2	2	9/32	7/8	1-1/8
81131	5/8-11	2	5/8	1-1/2	11/32	1-3/32	1-5/16
81132	5/8-11	2-1/2	5/8	1-1/2	11/32	1-3/32	1-5/16
81133	5/8-11	3	5/8	1-1/2	11/32	1-3/32	1-5/16
81134	5/8-11	3-1/2	5/8	2	11/32	1-3/32	1-5/16
81135	5/8-11	4	5/8	2	11/32	1-3/32	1-5/16
81136	5/8-11	6	5/8	2	11/32	1-3/32	1-5/16
81137	3/4-10	4	3/4	2	7/16	1-1/4	1-1/2
81138	3/4-10	4-1/2	3/4	2	7/16	1-1/4	1-1/2
81139	3/4-10	5	3/4	2	7/16	1-1/4	1-1/2
81140	3/4-10	5-1/2	3/4	2	7/16	1-1/4	1-1/2
81141	3/4-10	6	3/4	2	7/16	1-1/4	1-1/2
81142	3/4-10	7	3/4	2	7/16	1-1/4	1-1/2

Used in machine tables with a T-Slot, these 18-8 Stainless Steel T-Slot Bolts are corrosion resistant. Heads are designed to fit in the T-Slot and will not twist or jam. Coarse threads.

303 Stainless Steel

Steel Available, Page 50

Machined from Bar Stock



NEW!

Bolts

Eye Bolts

Part No.	Thread A	B	C	D	E	F
81311	1/4-20	7/8	2-1/8	3/16	1/4	1/2
81312	1/4-20	7/8	2-1/8	1/4	1/4	1/2
81313	1/4-20	1-1/4	3	3/16	1/4	1/2
81314	1/4-20	1-1/4	3	1/4	1/4	1/2
81315	5/16-18	1-1/4	2-1/2	1/4	5/16	5/8
81316	5/16-18	1-1/4	2-1/2	5/16	5/16	5/8
81317	5/16-18	1-1/2	3-1/2	1/4	5/16	5/8
81318	5/16-18	1-1/2	3-1/2	5/16	5/16	5/8
81319	5/16-18	2	4	1/4	5/16	5/8
81320	5/16-18	2	4	5/16	5/16	5/8
81321	3/8-16	1-1/2	3-1/2	5/16	3/8	3/4
81322	3/8-16	1-1/2	3-1/2	3/8	3/8	3/4
81323	3/8-16	2	3-3/4	5/16	3/8	3/4
81324	3/8-16	2	3-3/4	3/8	3/8	3/4
81325	3/8-16	2-1/2	5	5/16	3/8	3/4
81326	3/8-16	2-1/2	5	3/8	3/8	3/4
81327	1/2-13	1-1/2	3-3/4	3/8	1/2	1
81328	1/2-13	1-1/2	3-3/4	1/2	1/2	1
81329	1/2-13	2	5	3/8	1/2	1
81330	1/2-13	2	5	1/2	1/2	1
81331	1/2-13	2-1/2	5-1/2	3/8	1/2	1
81332	1/2-13	2-1/2	5-1/2	1/2	1/2	1
81333	5/8-11	1-3/4	4-1/2	5/8	5/8	1-1/4
81334	5/8-11	2	4-1/2	5/8	5/8	1-1/4
81335	5/8-11	2-1/2	6	5/8	5/8	1-1/4
81336	5/8-11	3	6	5/8	5/8	1-1/4
81337	3/4-10	2	4-1/2	3/4	3/4	1-1/2
81338	3/4-10	2-1/2	6	3/4	3/4	1-1/2

NEW!

Metric Eye Bolts - DIN 444

Part No.	Thread A	B	C	D	E	F
81339	M6	32	50	6	7	14
81340	M6	32	75	6	7	14
81341	M8	32	50	8	9	18
81342	M8	32	75	8	9	18
81343	M10	40	75	10	12	20
81344	M10	40	100	10	12	20
81345	M12	40	100	12	14	25
81346	M12	40	130	12	14	25
81347	M16	50	100	16	17	32
81348	M16	50	130	16	17	32

303 Stainless Steel

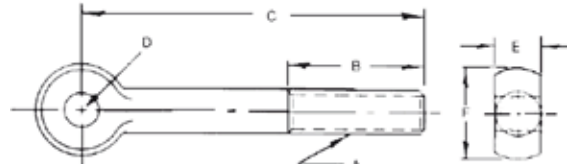
Steel Available, Page 82

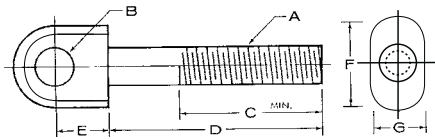
Machined from Bar Stock



Eye bolts are not recommended for lifting applications. See Hoist Rings on pages 102-112 for your lifting needs.

All Dimensions in Millimeters





NEW! Swing Bolts (Latch Bolts)

Stainless Steel Swing Bolts

Part No.	Thread A	B	C	D	E	F	G
81349	1/4-20	1/4	3/4	1-3/16	1-1/2	1/2	5/16
81350	1/4-20	1/4	1-1/4	2-3/16	2-1/2	1/2	5/16
81351	5/16-18	5/16	1	1-5/8	2	5/8	3/8
81352	5/16-18	5/16	1-3/8	2-5/8	3	5/8	3/8
81353	3/8-16	3/8	1-3/8	2	2-1/2	3/4	1/2
81354	3/8-16	3/8	2	3	3-1/2	3/4	1/2
81355	1/2-13	1/2	1-5/8	2-1/2	3-1/8	1	5/8
81356	1/2-13	1/2	2-1/2	3-1/2	4-1/8	1	5/8
81357	5/8-11	5/8	1-5/8	2-3/4	3-1/2	1-1/4	3/4
81358	5/8-11	5/8	2-1/2	4	4-3/4	1-1/4	3/4

Machined from bar stock

303 Stainless Steel

Steel Available, Page 81

Swing bolts are not recommended for lifting applications. See Hoist Rings on pages 102-112 for your lifting needs.

NEW! Screws

Stainless Steel Knurled Head Adjusting Screws

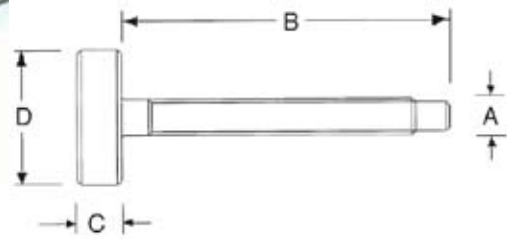
Part No.	Thread A	B	C	D
81216	10-32	1	5/16	3/4
81217	10-32	1-1/2	5/16	3/4
81218	10-32	2	5/16	3/4
81219	10-24	1-1/4	5/16	3/4
81220	10-24	1-5/8	5/16	3/4
81221	10-24	2	5/16	3/4
81222	1/4-20	1	5/16	1
81223	1/4-20	1-1/2	5/16	1
81224	1/4-20	2	5/16	1
81225	1/4-20	2-1/2	5/16	1
81226	5/16-18	1	3/8	1-1/8
81227	5/16-18	1-1/2	3/8	1-1/8
81228	5/16-18	1-3/4	3/8	1-1/8
81229	5/16-18	2-1/4	3/8	1-1/8
81230	5/16-18	2-3/4	3/8	1-1/8
81231	5/16-18	3	3/8	1-1/8
81232	3/8-16	1-1/2	7/16	1-1/4
81233	3/8-16	2	7/16	1-1/4
81234	3/8-16	2-1/2	7/16	1-1/4
81235	3/8-16	3	7/16	1-1/4
81236	3/8-16	3-1/2	7/16	1-1/4
81237	3/8-16	4	7/16	1-1/4
81238	1/2-13	2-1/2	1/2	1-1/4
81239	1/2-13	2-3/4	1/2	1-1/4
81240	1/2-13	3	1/2	1-1/4
81241	1/2-13	3-1/2	1/2	1-1/4

Two piece construction

Straight knurl

300 Series Stainless Steel

Steel Available, Page 83



NEW! Metric Stainless Steel Knurled Head Adjusting Screws

Part No.	Thread A	B	D	C	Tip Diameter	Tip Length
81242	M4	32	19	8	2	3
81243	M4	41	19	8	2	3
81244	M4	51	19	8	2	3
81245	M6	25	25	8	4	3
81246	M6	38	25	8	4	3
81247	M6	51	25	8	4	3
81248	M6	64	25	8	4	3
81249	M8	25	29	9.5	6	4
81250	M8	38	29	9.5	6	4
81251	M8	44	29	9.5	6	4
81252	M8	57	29	9.5	6	4
81253	M8	70	29	9.5	6	4
81254	M8	76	29	9.5	6	4
81255	M10	38	32	11	7	4
81256	M10	51	32	11	7	4
81257	M10	64	32	11	7	4
81258	M10	76	32	11	7	4
81259	M10	89	32	11	7	4
81260	M10	102	32	11	7	4
81261	M12	64	32	13	10	6
81262	M12	70	32	13	10	6
81263	M12	76	32	13	10	6
81264	M12	89	32	13	10	6

All Dimensions in Millimeters

Depending on the size, they are stamped or machined.

300 Series Stainless Steel

Steel Available, Page 62 and 64

Tolerances:

ID and OD are +/- .010.
 Thickness Tolerance varies by size:
 Up to 1/8" thick +.005/- .014.
 From 1/8 to 9/32" thick +.005/- .020
 Flat and Parallel to within 0.005"



NEW! Flat Washers

Industry Semi Standard Flat Washers Steel and Stainless Steel Thick and Extra Thick

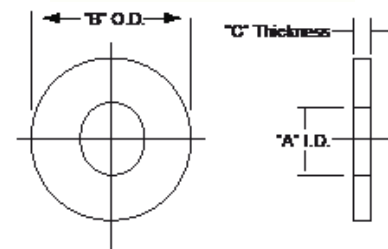
Part No.	A ID	B OD	C Thickness	R Radius
81040	0	1/16	1/8	.019
81041	1	5/64	5/32	.019
81042	2	3/32	3/16	.028
81043	4	1/8	1/4	1/16
81044	6	5/32	5/16	1/16
81046	8	11/64	3/8	1/16
81047	8	3/16	7/16	5/64
81048	1/4	9/32	1/2	5/64
81049	5/16	11/32	5/8	3/32
81050	5/16	11/32	11/16	1/8
81051	3/8	13/32	3/4	3/32
81052	3/8	13/32	1	1/8
81053	7/16	15/32	59/64	1/8
81054	1/2	17/32	1-1/16	3/16

NEW! Washers

Flat Washers

Regular

Part No.	Bolt Size	A ID	B OD	C Thickness	Net lbs Per 100
81080	8	3/16	7/16	5/64	1/2
81081	10	13/64	1/2	3/32	1/2
81082	1/4 M7	9/32	5/8	1/8	1
81083	5/16 M8	11/32	3/4	1/8	1-1/2
81084	3/8 M10	13/32	7/8	1/8	2
81085	7/16 M11	15/32	1	1/8	2-1/2
81086	1/2 M13	17/32	1-1/8	1/8	3
81087	5/8 M16	21/32	1-3/8	1/8	4
81088	3/4 M19	25/32	1-5/8	5/32	7-1/2
81089	7/8 M23	29/32	1-3/4	5/32	8
81090	1 M26	1-1/32	2	3/16	12-1/2
81091	1-1/8	1-5/32	2-1/4	7/32	14
81092	1-1/4 M32	1-9/32	2-1/4	3/16	14



NEW! Flat Washers

Heavy Duty

Part No.	Bolt Size	Outside Diameter	Hole Diameter	Thickness	Net lbs Per 100
81107	1/4 M7	5/8	9/32	13/16	1
81108	5/16 M8	3/4	11/32	3/16	1
81109	3/8 M10	1	13/32	3/16	2
81110	7/16 M11	1	1-15/32	3/16	3
81111	1/2 M13	1-1/8	17/32	7/32	5
81112	5/8 M16	1-3/8	21/32	3/16	7
81113	3/4 M19	1-5/8	25/32	1/4	12
81114	7/8 M23	1-3/4	29/32	1/4	14
81115	1 M26	2	1-1/32	1/4	16
81116	1 M26	2	1-1/32	9/32	17

Often used with a hex nut. Provides larger bearing surface than washer face of nut.

The standard Flat Washer used in the Tool and Die industry. These Flat Washers are thicker than standard washers. Depending on the size, they are stamped or machined.

300 Series Stainless Steel or 17-4 Stainless Steel thru hardened to C36-C42

Steel Available, Page 62 and 64

Spring Plunger Mounting Bases

NEW!

Full range of sizes from 8-32 thru 5/8-11. Used as mounting points for spring plungers and any spring loaded devices. Used for horizontal applications without the need for custom designed blocks and fixtures.

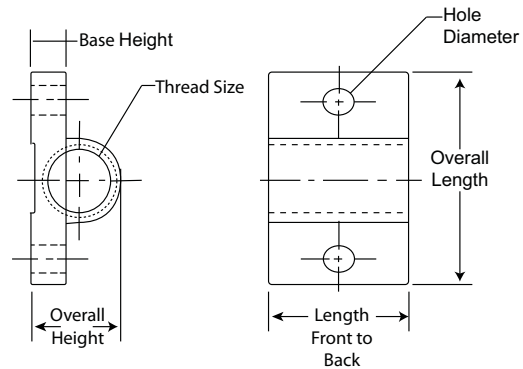
303 Stainless Steel

Steel Available, Page 35



Tooling Flanges

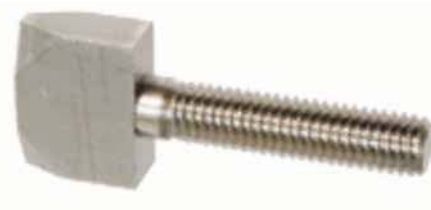
Part No.	Thread Size	Overall Length	Length Front to Back	Overall Height	Base Thickness	Hole Diameter
82608	8-32	.690	.500	.250	.090	1/8
82609	10-32	.690	.500	.270	.130	1/8
82610	1/4-20	.880	.690	.410	.190	9/64
82611	5/16-18	.940	.630	.410	.188	9/64
82612	3/8-16	1.130	.750	.470	.219	5/32
82613	1/2-13	1.500	1.00	.630	.250	13/64
82614	5/8-11	1.880	1.25	.800	.312	17/64



Chamfered corners quickly align screw with slot in lids, covers or plates.

18-8 Stainless Steel

Steel Available, Page 82

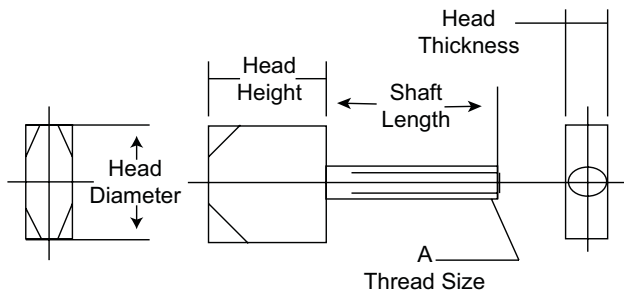


Quarter Turn Screws

NEW!

18-8 Stainless Steel

Part No.	Thread Size	Overall Length	Length Front to Back	Overall Height	Base Thickness
81012	10-24	1	1/2	1/2	3/16
81013	10-32	1	1/2	1/2	3/16
81014	10-32	1-1/2	1/2	1/2	3/16
81015	1/4-20	1-1/4	3/4	5/8	1/4
81016	1/4-20	1-3/4	3/4	5/8	1/4
81017	5/16-18	1-1/2	1	3/4	5/16
81018	5/16-18	2	1	3/4	5/16
81019	3/8-16	1-1/2	1	1	3/8
81020	3/8-16	2	1	1	3/8
81021	1/2-13	1-3/4	1-1/4	1	1/2
81022	1/2-13	2-1/4	1-1/4	1	1/2



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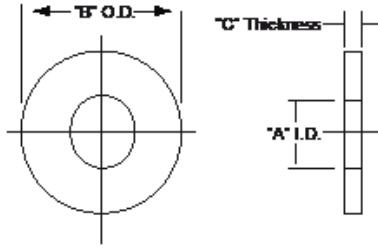
Northwestern



Washers



Heat Treated Steel
Black Oxide Finish



NEW SIZES!

Washers

Flat Washers

Regular

Part No.	Bolt Size	Outside Diameter	Hole Diameter	Thickness	Net lbs Per 100
81067	8	7/16	3/16	5/64	1/2
81068	10	1/2	13/64	3/32	1/2
16000	3/16 M5	1/2	13/64	3/32	1/2
* 16001	1/4 M7	5/8	9/32	1/8	1
* 16002	5/16 M8	3/4	11/32	1/8	1-1/2
* 16003	3/8 M10	7/8	13/32	1/8	2
16004	7/16 M11	1	15/32	1/8	2-1/2
* 16005	1/2 M13	1-1/8	17/32	1/8	3
* 16006	5/8 M16	1-3/8	21/32	1/8	4
* 16007	3/4 M19	1-5/8	25/32	5/32	7-1/2
* 16008	7/8 M23	1-3/4	29/32	5/32	8
* 16009	1 M26	2	1-1/32	3/16	12-1/2
81078	1-1/8	2-1/4	1-5/32	7/32	14
16011	1-1/4 M32	2-1/4	1-9/32	3/16	14

*Conform to TCMAI Standards

Low Carbon Steel, Commercial Case-Hard, Black Oxide Finish

Often used with a hex nut. Provides larger bearing surface than washer face of nut.

Extra thick for increased strength.

The standard Flat washer used in the Tool and Die industry. These Flat washers are thicker than standard washers. Depending on the size, they are stamped or machined.

Stainless Steel Available, Page 56 and 59

Metric Available, Page 59

NEW SIZES!

Flat Washers

Heavy Duty

Part No.	Bolt Size	Outside Diameter	Hole Diameter	Thickness	Net lbs Per 100
81903	1/4	5/8	9/32	3/16	1
81904	5/16	3/4	11/32	3/16	1
81905	3/8	1	13/32	3/16	2
16103	3/8 M10	7/8	13/32	3/16	3
81097	7/16	1	15/32	3/16	3
16105	1/2 M13	1-1/8	15/32	3/16	4-1/2
81099	1/2	1-1/8	17/32	7/32	5
16106	5/8 M16	1-3/8	21/32	3/16	6
81101	5/8	1-3/8	21/32	7/32	7
16107	3/4 M19	1-5/8	25/32	1/4	12
81102	3/4	1-7/8	25/32	1/4	12
81103	7/8	1-3/4	29/32	1/4	14
81104	7/8	2-1/8	29/32	9/32	15
16109	1	2	1-1/32	1/4	15
81106	1 M26	2	1-1/32	9/32	17



Flat Washer Assortment

Regular Assortment

Part No. 16201 Set consists of: 25-16000, 25-16001, 25-16002, 25-16003, 10-16004, 15-16005, 10-16006, 10-16007, 5-16008, 5-16009

Heavy Duty Assortment

Part No. 16202 Set consists of: 10-16103, 10-16105, 10-16106, 10-16107, 5-16109

Each set is shipped in a sturdy resin case, with dividers to keep each size separate.

Spherical Washers

Self-Aligning Washers

Set Includes Top and Bottom Washer

Set No.	Bolt Size	A	B	C	D	E	Radius	Net lbs Per 100
* 32001	1/4 M7	9/32	5/8	3/16	1/8	5/16	3/4	1-1/2
* 32002	5/16 M8	11/32	3/4	1/4	5/32	3/8	1	2-1/2
* 32003	3/8 M10	13/32	7/8	1/4	5/32	7/16	1-1/4	3-1/2
32004	7/16 M11	15/32	1	5/16	7/32	1/2	1-3/4	7-1/2
* 32005	1/2 M13	17/32	1-1/8	5/16	7/32	9/16	1-1/2	7
* 32006	5/8 M16	21/32	1-3/8	5/16	7/32	11/16	1-3/4	11
* 32007	3/4 M19	25/32	1-5/8	3/8	9/32	13/16	2-1/4	17
* 32008	7/8 M23	15/16	1-3/4	3/8	1/4	1	2-1/2	18
* 32009	1 M26	1-1/16	2	1/2	5/16	1-1/8	2-3/4	31

Larger Sizes									
32010	1-1/8 M30	1-3/16	2-1/4	1/2	11/32	1-1/4	3	40	
32011	1-1/4 M33	1-5/16	2-5/8	1/2	23/64	1-3/8	3	56	
32013	1-1/2 M39	1-9/16	2-7/8	9/16	27/64	1-5/8	3-1/2	73	
32014	1-5/8 M42	1-11/16	3-1/4	11/16	1/2	1-3/4	3-1/2	112	
32015	1-3/4 M46	1-13/16	3-1/4	11/16	1/2	1-7/8	3-1/2	110	
32016	2 M52	2-1/16	3-7/8	3/4	9/16	2-1/8	4	180	

*Conform to TCMAI Standards

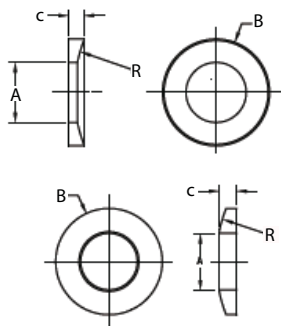
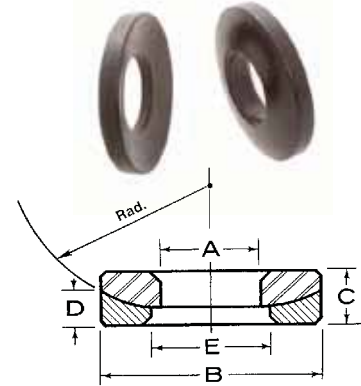
Radiused surfaces of this assembly adjust to correct misaligned parts and to eliminate undue stress on threaded members.

Tops and bottoms available separately. For top half, add "M" after 5 digit Part Number. Add "F" for bottom half.

Bottom half works with Spherical Flange Nuts

Spherical Washers for bolts larger than 2" available. Ask for price and delivery.

Stainless Steel Available, Page 56 and 59



Spherical Washers

Metric Steel DIN 6319 C and D

Steel Part Number		Stud Size	A ID	B OD	C Thickness	R Radius
81055	Male	M6	M6.4	M12	M2.3	M9
81056	Female		M7.1	M12	M2.8	
81057	Set		M12	M4.2		
81058	Male	M10	M10.5	M21	M4	M15
81059	Female		M12	M21	M4.2	
81060	Set		M21	M6.5		
81061	Male	M16	M17	M30	M5.3	M22
81062	Female		M19	M30	M6.2	
81063	Set		M30	M9.6		
81064	Male	M24	M25	M44	M8.2	M32
81065	Female		M28	M44	M9.5	
81066	Set		M44	M15.2		

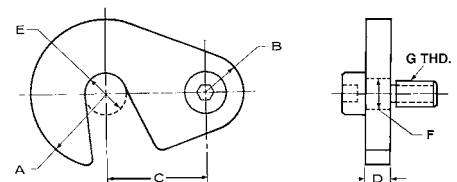
Available as individual male or female washers or as a matched set of one male and one female washer.

Swing "C" Washers

Complete With Shoulder Screws

Part No.	A	B	C	D	E	F	G	Net lbs Per 100
* 39001	3/4	3/8	1	1/4	13/32	3/8	5/16-18	15
39002	1	1/2	1-1/4	3/8	17/32	3/8	5/16-18	34
* 39003	1-1/8	9/16	1-1/2	3/8	21/32	1/2	3/8-16	46
* 39004	1-1/4	5/8	1-3/4	1/2	25/32	1/2	3/8-16	75

* Conform to TCMAI Standards



Made of low carbon steel, carburized, hardened and rust proofed. These items are used as a latch in the construction of jigs, fixtures and special machinery. They are generally used for end locations, and can be swung out of the way so that the part can be inserted and removed quickly.

“Williams” Washers & Dress (Countersunk) Flat Washers

NEW!

Beveled Machined Washers Case Hard and Oiled

Part No.	Bolt Size	A ID	B OD	C Thickness
81030	10	13/64	1/2	3/32
81031	1/4	9/32	5/8	1/8
81032	5/16	11/32	3/4	1/8
81033	3/8	13/32	7/8	1/8
81034	7/16	15/32	1	5/32
81035	1/2	17/32	1	3/16
81036	5/8	21/32	1-1/4	1/4
81037	3/4	25/32	1-1/2	1/4
81038	7/8	29/32	1-3/4	1/4
81039	1	1-1/32	2	5/16

A thick Flat Washer used for spacing applications. These washers are manufactured on our screw machines - NOT STAMPED - with a large bevel on the outside edge. Chamfered outside edge speeds assembly and fitting operations.

Fully machined flat washer

12L14 Ledloy Low Carbon Steel

NEW!

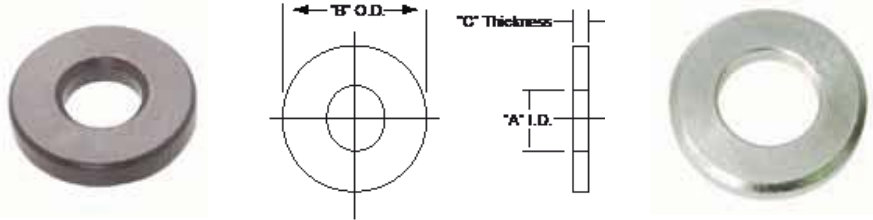
“Williams” Washers

Machined with Outside Bevel Soft, Plain and Oiled

Part No.	Bolt Size	A ID	B OD	C Thickness
82629	10	13/64	1/2	3/32
82630	1/4	9/32	5/8	1/8
82631	5/16	11/32	3/4	1/8
82632	3/8	13/32	7/8	1/8
82633	7/16	15/32	1	5/32
82634	1/2	17/32	1	3/16
82635	5/8	21/32	1-1/4	1/4
82636	3/4	25/32	1-1/2	1/4
82637	7/8	29/32	1-3/4	1/4
82638	1	1-1/32	2	5/16

Material: 12L14 Ledloy Low Carbon Steel, Plain Finish. (Note: Case Hardening presents a mottled appearance.)

Fully machined flat washer



Dress (Countersunk) Flat Washers

NEW!

Dress(Countersunk) Flat Washers Inch Sizes

Part No.	Screw Size	A ID	B OD	C Thickness
81023	8	3/16	3/4	1/8
81024	10	13/64	1-1/4	9/64
81025	1/4	9/32	1-1/4	9/32

NEW!

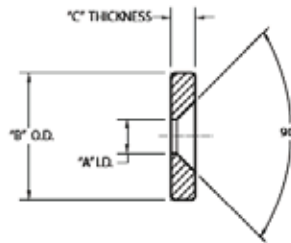
Metric Sizes

Part No.	Screw Size	A ID	B OD	C Thickness
81026	M4	M4.3	M16	M3
81027	M4	M4.3	M20	M3
81028	M5	M5.3	M22	M3.5
81029	M6	M6.4	M32	M4

Designed to accept the head of standard 82 degree flat head screws. This allows the screw to seat flush, and presents a finished or dressed appearance.

Manufactured of 12L14 cold rolled steel, case hardened to .005/.010 depth and black oxide finish.

Tolerances: Inch: +/- .010
Metric: +/- .3mm



Flat Washers

Industry Semi Standard Flat Washers Steel & Stainless Steel Thick and Extra Thick

NEW!

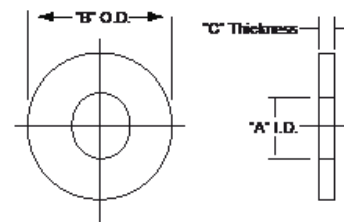
Part No.	A ID	B OD	C Thickness	R Radius
81040	0	1/16	1/8	.019
81041	1	5/64	5/32	.019
81042	2	3/32	3/16	.028
81043	4	1/8	1/4	1/16
81044	6	5/32	5/16	1/16
81046	8	11/64	3/8	1/16
81047	8	3/16	7/16	5/64
81048	1/4	9/32	1/2	5/64
81049	5/16	11/32	5/8	3/32
81050	5/16	11/32	11/16	1/8
81051	3/8	13/32	3/4	3/32
81052	3/8	13/32	1	1/8
81053	7/16	15/32	59/64	1/8
81054	1/2	17/32	1-1/16	3/16

Depending on the size, they are stamped or machined.

Low Carbon Steel, Commercial Case Hard, Black Oxide Finish

Stainless Steel Available, Page 59

Tolerances:
ID and OD are +/- .010. Thickness Tolerance varies by size:
Up to 1/8" thick +.005/- .014.
From 1/8 to 9/32" thick +.005/- .020
Flat and Parallel to within 0.005"





Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing

Northwestern



Knobs & Handles

Quick-Acting Knobs

Part No.	Thread Size	Outside Dimensions				Net lbs Per 100
		A	B	C	D	
28101	1/4-20	1-1/8	9/16	5/8	5/16	6
28102	5/16-18	1-1/2	11/16	7/8	3/8	11
28103	3/8-16	2	13/16	1	1/2	22
28104	1/2-13	2-1/2	1	1-1/8	9/16	33
28105	5/8-11	3	1-1/4	1-1/4	5/8	58
28106	3/4-10	3	1-1/4	1-1/4	5/8	50

Metric

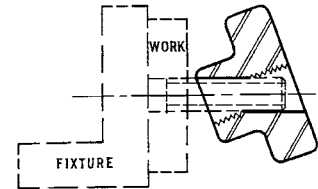
28201	M6 x 1.0	30	14	16	8	6
28202	M8 x 1.25	38	17	22	10	11
28203	M10 x 1.5	50	21	25	13	22
28204	M12 x 1.75	64	25	30	14	33
28205	M16 x 2.0	76	32	32	16	58

These knobs are not poorly threaded or rejects. This unique design allows them to perform their function.

Saves time where knob must be completely removed from stud member.

These steel knobs are excellent for fast clamping. The oblong hole lets you tilt and slide the knob onto a stud. For clamping action, simply straighten the knob, turn clockwise and the threads will engage. To remove knob, tilt and slide off.

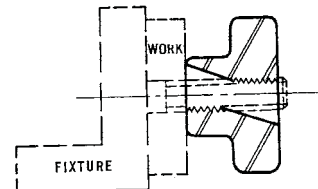
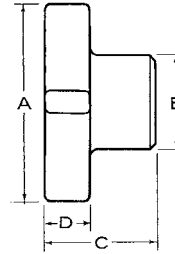
Not suitable for vibrating equipment.



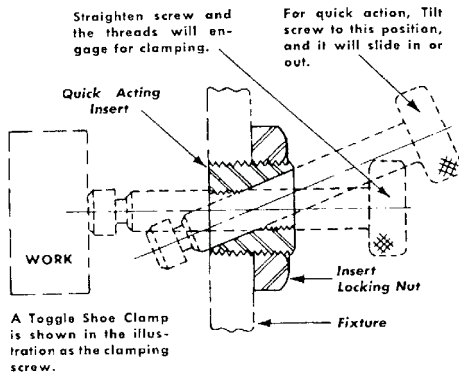
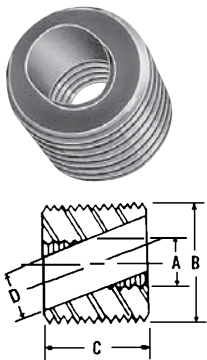
Tilt knob and it will slide in and out.

Quick-Acting Inserts

Part No.	A	B	C	D	Net lbs Per 100
26001	1/4-20	1/2-20	1/2	17/64	1-1/2
26002	5/16-18	5/8-18	5/8	21/64	3-1/4
26003	3/8-16	3/4-16	3/4	25/64	5-1/2
26004	1/2-13	1-14	1	33/64	14
26005	5/8-11	1-1/4-12	1-1/4	41/64	27



Straighten knob and threads will engage for clamping.



Insert Locking Nuts

Part No.	Use With	Thread Size	Hex Size	Thickness	Net lbs Per 100
27001	26001	1/2-20	3/4	3/16	2-1/4
27002	26002	5/8-18	1-1/16	1/4	4-1/4
27003	26003	3/4-16	1-1/8	5/16	8-1/2
27004	26004	1-14	1-1/2	3/8	13
27005	26005	1-1/4-12	1-3/4	7/16	21



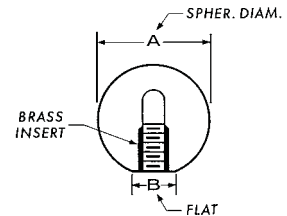
Heat Treated Steel
Black Oxide Finish

Plastic Ball Knobs

Black With Tapped Brass Inserts

Part No.	Ref. No.	Thread Size And Depth	A Diam.	B Flat	Net lbs Per 100
23001	PBK-15	10-32 x 5/16	3/4	3/8	2
23002	PBK-25	1/4-20 x 7/16	1	1/2	3
23003	PBK-26	1/4-28 x 7/16	1	1/2	3
23004	PBK-27	5/16-18 x 7/16	1	1/2	3
23005	PBK-28	5/16-24 x 7/16	1	1/2	3
23006	PBK-45	3/8-16 x 1/2	1-3/8	5/8	7
23007	PBK-46	3/8-24 x 1/2	1-3/8	5/8	7
23008	PBK-47	1/2-13 x 5/8	1-3/8	5/8	8
23009	PBK-48	1/2-20 x 5/8	1-3/8	5/8	8
23010	PBK-65	1/2-13 x 5/8	1-7/8	3/4	18
23011	PBK-66	1/2-20 x 5/8	1-7/8	3/4	18
*23012	PBK-67	* 5/8-18 x 3/4	1-7/8	3/4	15

*Molded Thread



These phenolic knobs have a smooth, hard, glossy surface. The material is resistant to electricity, water, oils and most common chemicals.

Steel Hand Knobs

Smooth finish ensures hand comfort even after repeated use.

Reamed and Tapped Knobs Have a Black Finish (Blank Knobs Are Centered)

Type	Blank			Tapped				Reamed				Outside Dimensions			
	Part No.	Ref No.	lbs / 100	Part No.	Thread Size	Thread Depth	lbs / 100	Part No.	Hole Size	Hole Depth	lbs / 100	A	B	C	D
Star	*17301	HK-1	7	17501	1/4-20	Thru	6	17401	1/4	Thru	6	1-1/8	9/16	5/8	5/16
Star				*17502	1/4-20	7/16	6	*17402	1/4	7/16	6	1-1/8	9/16	5/8	5/16
Star	*17302	HK-2	12	17503	5/16-18	Thru	10	17403	5/16	Thru	10	1-1/2	11/16	7/8	3/8
Star				*17504	5/16-18	5/8	11	*17404	5/16	5/8	10	1-1/2	11/16	7/8	3/8
Star	17303	HK-3	22	17505	3/8-16	Thru	19	17405	3/8	Thru	19	2	13/16	1	1/2
Star	*17304	HK-30	23	*17506	3/8-16	3/4	21	*17406	3/8	3/4	20	2	13/16	1-1/8	1/2
Star	17305	HK-4	34	17507	1/2-13	Thru	30	17407	1/2	Thru	29	2-1/2	1	1-1/8	9/16
Star	*17306	HK-40	39	*17508	1/2-13	1	35	*17408	1/2	1	35	2-1/2	1	1-1/2	9/16
Star				*17509	5/8-11	1	33	*17409	5/8	1	34	2-1/2	1	1-1/2	9/16
Star	17307	HK-5	61	17510	5/8-11	Thru	54	17410	5/8	Thru	52	3	1-1/4	1-1/4	5/8
Star	*17308	HK-50	72	*17511	5/8-11	1-1/8	65	*17411	5/8	1-1/8	64	3	1-1/4	1-3/4	5/8
Star				*17512	3/4-10	1-1/8	62	*17412	3/4	1-1/8	61	3	1-1/4	1-3/4	5/8
Hexagon	17309	HK-6	38	17513	3/8-16	1-1/8	35	17413	3/8	1-1/8	35	2	7/8	1-5/8	3/8
Hexagon	17310	HK-7	61	17514	1/2-13	1-1/8	57	17414	1/2	1-1/8	57	2-1/2	1	1-7/8	7/16
Hexagon	17311	HK-8	97	17515	5/8-11	1-1/8	92	17415	5/8	1-1/8	91	3	1-1/4	2	1/2
Hexagon				17516	3/4-10	1-1/8	88	17416	3/4	1-1/8	87	3	1-1/4	2	1/2

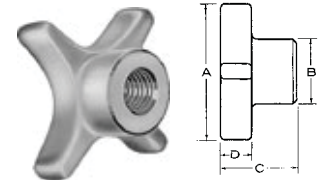
* Conforms to TCMAI Standards

Faces of reamed and tapped knobs are square to the hole. Special reaming, tapping and machining available.

Star Type



Hexagon Type

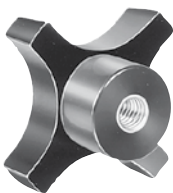


Aluminum Hand Knobs

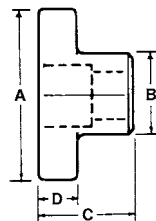
SAE 319 - ASTM - SC64 C (Blank Knobs Are Centered)

Type	Blank			Tapped				Reamed				Outside Dimensions			
	Part No.	Ref No.	lbs / 100	Part No.	Thread Size	Thread Depth	lbs / 100	Part No.	Hole Size	Hole Depth	lbs / 100	A	B	C	D
Star	*17001	AHK-1	3	17201	1/4-20	Thru	3	17101	1/4	Thru	3	1-1/8	9/16	5/8	5/16
Star				*17202	1/4-20	7/16	3	*17102	1/4	7/16	3	1-1/8	9/16	5/8	5/16
Star	*17002	AHK-2	5	17203	5/16-18	Thru	5	17103	5/16	Thru	5	1-1/2	11/16	7/8	3/8
Star				*17204	5/16-18	5/8	5	*17104	5/16	5/8	5	1-1/2	11/16	7/8	3/8
Star	17003	AHK-3	10	17205	3/8-16	Thru	9	17105	3/8	Thru	9	2	13/16	1	1/2
Star	*17004	AHK-30	10	*17206	3/8-16	3/4	9	*17106	3/8	3/4	9	2	13/16	1-1/8	1/2
Star	17005	AHK-4	15	17207	1/2-13	Thru	13	17107	1/2	Thru	13	2-1/2	1	1-1/8	9/16
Star	*17006	AHK-40	20	*17208	1/2-13	1	18	*17108	1/2	1	18	2-1/2	1-1/8	1-1/2	1/2
Star				*17209	5/8-11	1	17	*17109	5/8	1	17	2-1/2	1-1/8	1-1/2	1/2
Star	17007	AHK-5	26	17210	5/8-11	Thru	23	17110	5/8	Thru	23	3	1-1/4	1-1/4	5/8
Star	*17008	AHK-50	30	*17211	5/8-11	1-1/8	27	*17111	5/8	1-1/8	27	3	1-1/4	1-3/4	1/2
Star				*17212	3/4-10	1-1/8	25	*17112	3/4	1-1/8	25	3	1-1/4	1-3/4	1/2
Hexagon	17009	AHK-6	17	17213	3/8-16	1-1/8	16	17113	3/8	1-1/8	15	2	7/8	1-5/8	3/8
Hexagon	17010	AHK-7	26	17214	1/2-13	1-1/8	25	17114	1/2	1-1/8	24	2-1/2	1	1-7/8	7/16
Hexagon	17011	AHK-8	43	17215	5/8-11	1-1/8	40	17115	5/8	1-1/8	39	3	1-1/4	2	1/2
Hexagon				17216	3/4-10	1-1/8	38	17116	3/4	1-1/8	37	3	1-1/4	2	1/2

* Conforms to TCMAI Standards



Thru Hole



These phenolic knobs have a smooth, hard, glossy surface. The material is resistant to electricity, water, oils and most common chemicals.

Plastic Hand Knobs

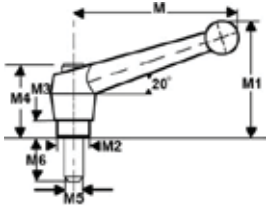
With Tapped Brass Inserts

Part No.	Thread	Thread Length	A	B	C	D	Net lbs Per 100
23101	1/4-20	3/8	1-1/4	5/8	7/8	1/2	4
23102	5/16-18	3/8	1-1/4	5/8	7/8	1/2	4
23103	5/16-18	1/2	1-3/4	13/16	1	1/2	5
23104	3/8-16	1/2	1-3/4	13/16	1	1/2	5
23105	3/8-16	9/16	2-1/4	1	1-1/8	9/16	7
23106	1/2-13	9/16	2-1/4	1	1-1/8	9/16	7

Knobs & Handles

Lift and Release: You are able to disengage the internal splines while the insert remains stationary, allowing you to rotate the handle to the desired position. The internal conical spring returns the handle to re-engage the splines for tightening or loosening.

Instantly Adjustable to 20-45 Different Handle Positions Depending on Size Stud, Screw and Spring are 303 Stainless Steel.



Zinc Die Cast



Solid Stainless Steel



Zinc Die Cast w/ S.S. Insert



Ball Style Adjustable Handles

Inch Style - With Stud

Part Numbers		Zinc Die Cast w/ SS Insert	Size (Inch)	M	M1	M2	M3	M4	M5 (Thread)	M6 (Length)
Zinc Die Cast	Stainless									
82145	82201	82237	1	1.57	1.3	.39	.15	.95	10-32	.39
82146	82202	82238	1	1.57	1.3	.39	.15	.95	10-32	.59
82147	82203	82239	1	1.57	1.3	.39	.15	.95	10-32	.78
82148	82204	82240	1	1.57	1.3	.39	.15	.95	10-32	1.18
82149	82205	82241	1	1.57	1.3	.39	.15	.95	10-24	.39
82150	82206	82242	1	1.57	1.3	.39	.15	.95	10-24	.59
82151	82207	82243	1	1.57	1.3	.39	.15	.95	10-24	.48
82152	82208	82244	1	1.57	1.3	.39	.15	.95	10-24	1.18
82153	82209	82245	1	1.57	1.3	.39	.15	.95	1/4-20	.39
82154	82210	82246	1	1.57	1.3	.39	.15	.95	1/4-20	.59
82155	82211	82247	1	1.57	1.3	.39	.15	.95	1/4-20	.78
82156	82212	82248	1	1.57	1.3	.39	.15	.95	1/4-20	1.18
82157	82213	82249	1	1.57	1.3	.39	.15	.95	1/4-20	1.57
82158	82214	82250	1	1.57	1.3	.39	.15	.95	1/4-20	1.77
82159	82215	82251	2	2.6	1.8	.50	.30	1.1	5/16-18	.59
82160	82216	82252	2	2.6	1.8	.50	.30	1.1	5/16-18	.78
82161	82217	82253	2	2.6	1.8	.50	.30	1.1	5/16-18	1.18
82162	82218	82254	2	2.6	1.8	.50	.30	1.1	5/16-18	1.57
82163	82219	82255	2	2.6	1.8	.50	.30	1.1	5/16-18	1.77
82164	82220	82256	2	2.6	1.8	.50	.30	1.1	5/16-18	1.96
82165	82221	82257	2	2.6	1.8	.50	.30	1.1	5/16-18	2.36
82166	-	-	2	2.6	1.8	.50	.30	2.1	3/8-16	.59
82167	-	-	2	2.6	1.8	.50	.30	2.1	3/8-16	.78
82168	-	-	2	2.6	1.8	.50	.30	2.1	3/8-16	1.18
82169	-	-	2	2.6	1.8	.50	.30	2.1	3/8-16	1.57
82170	-	-	2	2.6	1.8	.50	.30	2.1	3/8-16	1.77
82171	-	-	2	2.6	1.8	.50	.30	2.1	3/8-16	1.96
82172	-	-	2	2.6	1.8	.50	.30	2.1	3/8-16	2.36
82173	82222	82258	3	3.15	2.28	.62	.39	1.47	3/8-16	.59
82174	82223	82259	3	3.15	2.28	.62	.39	1.47	3/8-16	.78
82175	82224	82260	3	3.15	2.28	.62	.39	1.47	3/8-16	1.18
82176	82225	82261	3	3.15	2.28	.62	.39	1.47	3/8-16	1.57
82177	82226	82262	3	3.15	2.28	.62	.39	1.47	3/8-16	1.77
82178	82227	82263	3	3.15	2.28	.62	.39	1.47	3/8-16	1.96
82179	82228	82264	3	3.15	2.28	.62	.39	1.47	3/8-16	2.36
82180	-	-	4	3.74	2.63	.75	.39	1.68	3/8-16	.59
82181	-	-	4	3.74	2.63	.75	.39	1.68	3/8-16	.78
82182	-	-	4	3.74	2.63	.75	.39	1.68	3/8-16	1.18
82183	-	-	4	3.74	2.63	.75	.39	1.68	3/8-16	1.57
82184	-	-	4	3.74	2.63	.75	.39	1.68	3/8-16	1.77
82185	-	-	4	3.74	2.63	.75	.39	1.68	3/8-16	1.96
82186	-	-	4	3.74	2.63	.75	.39	1.68	3/8-16	2.36
82187	82229	82265	4	3.74	2.63	.75	.39	1.68	1/2-13	.59
82188	82230	82266	4	3.74	2.63	.75	.39	1.68	1/2-13	.78
82189	82231	82267	4	3.74	2.63	.75	.39	1.68	1/2-13	1.18
82190	82232	82268	4	3.74	2.63	.75	.39	1.68	1/2-13	1.38
82191	82233	82269	4	3.74	2.63	.75	.39	1.68	1/2-13	1.57
82192	82234	82270	4	3.74	2.63	.75	.39	1.68	1/2-13	1.77
82193	82235	82271	4	3.74	2.63	.75	.39	1.68	1/2-13	1.96
82194	82236	82272	4	3.74	2.63	.75	.39	1.68	1/2-13	2.36
82195	-	-	5	4.33	3.11	.90	.47	2	1/2-13	.98
82196	-	-	5	4.33	3.11	.90	.47	2	1/2-13	1.57
82197	-	-	5	4.33	3.11	.90	.47	2	1/2-13	1.97
82198	-	-	5	4.33	3.11	.90	.47	2	1/2-13	2.36
82199	-	-	5	4.33	3.11	.90	.47	2	5/8-11	1.57
82200	-	-	5	4.33	3.11	.90	.47	2	5/8-11	2.36

NEW!

Ball Style Adjustable Handles

Inch Style - Blank, Tapped and Reamed

Part Numbers		Zinc Die Cast w/ SS Insert	Size (Inch)	M	M1	M2	M3	M4	M5	M6	M7
Zinc Die Cast	Stainless										
82273	82298	82318	1	Blank	.35	.53	.39	.15	1.3	.95	1.57
82274	82299	82319	1	10-24 Tap	.35	.53	.39	.15	1.3	.95	1.57
82275	82300	82320	1	1/4-20 Tap	.35	.53	.39	.15	1.3	.95	1.57
82276	82301	82321	1	1/4 Ream	.35	.53	.39	.15	1.3	.95	1.57
82277	82302	82322	1	10-32 Tap	.35	.53	.39	.15	1.3	.95	1.57
82278	82303	82323	2	Blank	.47	.71	.53	.25	1.81	1.14	2.56
82279	82304	82324	2	1/4-20 Tap	.47	.71	.53	.25	1.81	1.14	2.56
82280	82305	82325	2	5/16-18 Tap	.47	.71	.53	.25	1.81	1.14	2.56
82281	82306	82326	2	1/4 Ream	.47	.71	.53	.25	1.81	1.14	2.56
82282	82307	82327	2	5/16 Ream	.47	.71	.53	.25	1.81	1.14	2.56
82283	82308	82328	3	Blank	.55	.84	.62	.39	2.28	1.47	3.15
82284	82309	82329	3	5/16-18 Tap	.55	.84	.62	.39	2.28	1.47	3.15
82285	82310	82330	3	3/8-16 Tap	.55	.84	.62	.39	2.28	1.47	3.15
82286	82311	82331	3	5/16 Ream	.55	.84	.62	.39	2.28	1.47	3.15
82287	82312	82332	3	3/8 Ream	.55	.84	.62	.39	2.28	1.47	3.15
82288	82313	82333	4	Blank	.67	1	.75	.39	2.63	1.68	3.74
82289	82314	82334	4	3/8-16 Tap	.67	1	.75	.39	2.63	1.68	3.74
82290	82315	82335	4	1/2-13 Tap	.67	1	.75	.39	2.63	1.68	3.74
82291	82316	82336	4	3/8 Ream	.67	1	.75	.39	2.63	1.68	3.74
82292	82317	82337	4	1/2 Ream	.67	1	.75	.39	2.63	1.68	3.74
82293	-	-	5	Blank	.90	1.2	.9	.47	3.11	2	4.33
82294	-	-	5	1/2-13 Tap	.90	1.2	.9	.47	3.11	2	4.33
82295	-	-	5	5/8-11 Tap	.90	1.2	.9	.47	3.11	2	4.33
82296	-	-	5	1/2 Ream	.90	1.2	.9	.47	3.11	2	4.33
82297	-	-	5	5/8 Ream	.90	1.2	.9	.47	3.11	2	4.33

Lift and Release: You are able to disengage the internal splines while the insert remains stationary, allowing you to rotate the handle to the desired position. The internal conical spring returns the handle to re-engage the splines for tightening or loosening.

Zinc Die Cast:

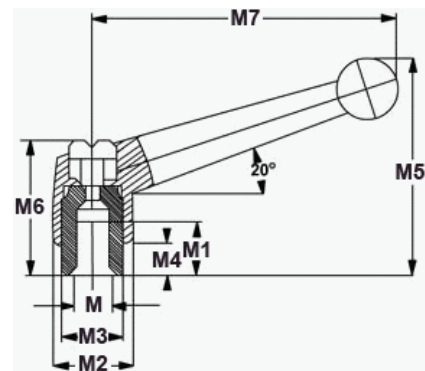
Handle Material is Die Cast Zinc
 Smooth, Comfortable, Ball Style Design with Beautiful Black Gloss Powder Coated Finish
 Insert, Screw & Spring are Made from 303 Stainless Steel
 Instantly Adjustable to 20-45 Different Handle Positions Depending on Size
 Handle Color is Black.

Stainless Steel:

100% Stainless Steel
 Handle is made from Solid 303 Stainless Steel & Completely Cavity Free
 Stud, Screw & Spring are 303 Stainless Steel
 Smooth, Bright Finish
 Strong yet Attractive

The ideal handle solution for the following industries:

- Medical
- Food
- Chemical
- Pharmaceutical
- Marine



Zinc Die Cast



Solid Stainless Steel



Zinc Die Cast w/ S.S. Insert

NEW!

Modern Style Adjustable Handles

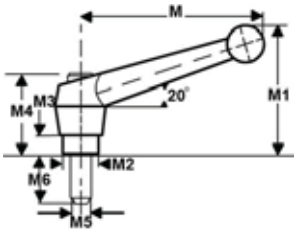
Inch Style - With Stud



Zinc & Plastic



Zinc & Plastic w/ SS. Insert



Part Numbers				M	M1	M2	M3	M4	M5 (Thread)	M6 (Length)
Zinc	Plastic	Zinc w/ SS Insert	Plastic w/ SS Insert							
82338	82394	82444	82480	1.57	1.22	.39	.15	.95	10-32	.39
82339	82395	82445	82481	1.57	1.22	.39	.15	.95	10-32	.59
82340	82396	82446	82482	1.57	1.22	.39	.15	.95	10-32	.78
82341	82397	82447	82483	1.57	1.22	.39	.15	.95	10-32	1.18
82342	82398	82448	82484	1.57	1.22	.39	.15	.95	10-32	0.39
82343	82399	82449	82485	1.57	1.22	.39	.15	.95	10-32	0.59
82344	82400	82450	82486	1.57	1.22	.39	.15	.95	10-32	0.78
82345	82401	82451	82487	1.57	1.22	.39	.15	.95	10-24	1.18
82346	82402	82452	82488	1.57	1.22	.39	.15	.95	10-25	.39
82347	82403	82453	82489	1.57	1.22	.39	.15	.95	10-26	.59
82348	82404	82454	82490	1.57	1.22	.39	.15	.95	10-27	.78
82349	82405	82455	82491	1.57	1.22	.39	.15	.95	10-28	1.18
82350	82406	82456	82492	1.57	1.22	.39	.15	.95	10-29	1.57
82351	82407	82457	82493	1.57	1.22	.39	.15	.95	1/4-20	1.77
82352	82408	82458	82494	1.57	1.22	.39	.15	.95	1/4-20	0.59
82353	82409	82459	82495	1.57	1.22	.39	.15	.95	1/4-20	0.78
82354	82410	82460	82496	1.57	1.22	.39	.15	.95	1/4-20	1.18
82355	82411	82461	82497	1.57	1.22	.39	.15	.95	1/4-20	1.57
82356	82412	82462	82498	1.57	1.22	.39	.15	.95	1/4-20	1.77
82357	82413	82463	82499	1.57	1.22	.39	.15	.95	1/4-20	1.96
82358	82414	82464	82500	2.56	1.69	.53	.25	1.14	5/16-18	2.36
82359	82415	-	-	2.56	1.69	.53	.25	1.14	5/16-18	0.59
82360	82416	-	-	2.56	1.69	.53	.25	1.14	5/16-18	0.78
82361	82417	-	-	2.56	1.69	.53	.25	1.14	5/16-18	1.18
82362	82418	-	-	2.56	1.69	.53	.25	1.14	5/16-18	1.57
82363	82419	-	-	2.56	1.69	.53	.25	1.14	5/16-18	1.77
82364	82420	-	-	2.56	1.69	.53	.25	1.14	5/16-18	1.96
82365	82421	-	-	2.56	1.69	.53	.25	1.14	3/8-16	2.36
82366	82422	82465	82501	2.56	1.69	.53	.25	1.14	3/8-16	0.59
82367	82423	82466	82502	2.56	1.69	.53	.25	1.14	3/8-16	0.78
82368	82424	82467	82503	2.56	1.69	.53	.25	1.14	3/8-16	1.18
82369	82425	82468	82504	2.56	1.69	.53	.25	1.14	3/8-16	1.57
82370	82426	82469	82505	2.56	1.69	.53	.25	1.14	3/8-16	1.77
82371	82427	82470	82506	2.56	1.69	.53	.25	1.14	3/8-16	1.96
82372	82428	82471	82507	3.15	2.16	.62	.39	1.47	3/8-16	2.36
82373	82429	-	-	3.15	2.16	.62	.39	1.47	3/8-16	0.59
82374	82430	-	-	3.15	2.16	.62	.39	1.47	3/8-16	0.78
82375	82431	-	-	3.15	2.16	.62	.39	1.47	3/8-16	1.18
82376	82432	-	-	3.15	2.16	.62	.39	1.47	3/8-16	1.57
82377	82433	-	-	3.15	2.16	.62	.39	1.47	3/8-16	1.77
82378	82434	-	-	3.15	2.16	.62	.39	1.47	3/8-16	1.96
82379	82435	-	-	3.74	2.52	.75	.39	1.68	1/2-13	2.36
82380	82436	82472	82508	3.74	2.52	.75	.39	1.68	1/2-13	.59
82381	82437	82473	82509	3.74	2.52	.75	.39	1.68	1/2-13	.78
82382	82438	82474	82510	3.74	2.52	.75	.39	1.68	1/2-13	1.18
82383	82439	82475	82511	3.74	2.52	.75	.39	1.68	1/2-13	1.38
82384	82440	82476	82512	3.74	2.52	.75	.39	1.68	1/2-13	1.57
82385	82441	82477	82513	3.74	2.52	.75	.39	1.68	1/2-13	1.77
82386	82442	82478	82514	3.74	2.52	.75	.39	1.68	1/2-13	1.96
82387	82443	82479	82515	3.74	2.52	.75	.39	1.68	1/2-13	2.36
82388	-	-	-	3.74	2.52	.75	.39	1.68	1/2-13	.98
82389	-	-	-	3.74	2.52	.75	.39	1.68	1/2-13	1.57
82390	-	-	-	3.74	2.52	.75	.39	1.68	1/2-13	1.97
82391	-	-	-	4.33	2.95	.90	.47	2	1/2-13	2.36
82392	-	-	-	4.33	2.95	.90	.47	2	1/2-13	1.57
82393	-	-	-	4.33	2.95	.90	.47	2	5/8-11	2.36

Lift and Release: You are able to disengage the internal splines while the insert remains stationary, allowing you to rotate the handle to the desired position. The internal conical spring returns the handle to re-engage the splines for tightening or loosening.

Instantly Adjustable to 20-45 Different Handle Positions Depending on Size. Stud Machined from Solid Bar.

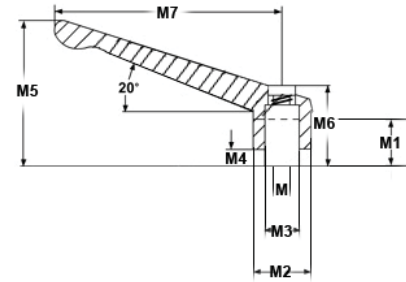
Plastic Handles have a Molded in Metal Spline Insert.



Zinc & Plastic



Zinc & Plastic w/ SS. Insert



Modern Style Adjustable Handles

Inch Style - Blank, Tapped and Reamed

Part Numbers				Size (Inch)	M	M1	M2	M3	M4	M5	M6	M7
Zinc	Plastic	Zinc w/ SS Insert	Plastic w/ SS Insert									
82516	82541	82561	82581	1	Blank	.35	.53	.39	.15	1.22	.95	1.57
82517	82542	82562	82582	1	10-24 Tap	.35	.53	.39	.15	1.22	.95	1.57
82518	82543	82563	82583	1	1/4-20 Tap	.35	.53	.39	.15	1.22	.95	1.57
82519	82544	82564	82584	1	1/4 Ream	.35	.53	.39	.15	1.22	.95	1.57
82520	82545	82565	82585	1	10-32 Tap	.35	.53	.39	.15	1.22	.95	1.57
82521	82546	82566	82586	1	Blank	.47	.71	.53	.25	1.69	1.14	2.56
82522	82547	82567	82587	1	1/4-20 Tap	.47	.71	.53	.25	1.69	1.14	2.56
82523	82548	82568	82588	1	5/16-18 Tap	.47	.71	.53	.25	1.69	1.14	2.56
82524	82549	82569	82589	1	1/4 Ream	.47	.71	.53	.25	1.69	1.14	2.56
82525	82550	82570	82590	2	5/16 Ream	.47	.71	.53	.25	1.69	1.14	2.56
82526	82551	82571	82591	2	Blank	.55	.84	.62	.39	2.16	1.47	3.15
82527	82552	82572	82592	2	5/16-18 Tap	.55	.84	.62	.39	2.16	1.47	3.15
82528	82553	82573	82593	2	3/8-16 Tap	.55	.84	.62	.39	2.16	1.47	3.15
82529	82554	82574	82594	2	5/16 Ream	.55	.84	.62	.39	2.16	1.47	3.15
82530	82555	82575	82595	3	3/8 Ream	.55	.84	.62	.39	2.16	1.47	3.15
82531	82556	82576	82596	3	Blank	.67	1	.75	.39	2.52	1.68	3.74
82532	82557	82577	82597	3	3/8-16 Tap	.67	1	.75	.39	2.52	1.68	3.74
82533	82558	82578	82598	3	1/2-13 Tap	.67	1	.75	.39	2.52	1.68	3.74
82534	82559	82579	82599	3	3/8 Ream	.67	1	.75	.39	2.52	1.68	3.74
82535	82560	82580	82600	4	1/2 Ream	.67	1	.75	.39	2.52	1.68	3.74
82536				4	Blank	.90	1.2	.90	.47	2.95	2	4.33
82537				4	1/2-13 Tap	.90	1.2	.90	.47	2.95	2	4.33
82538				4	5/8-11 Tap	.90	1.2	.90	.47	2.95	2	4.33
82539				4	1/2 Ream	.90	1.2	.90	.47	2.95	2	4.33
82540				5	5/8 Ream	.90	1.2	.90	.47	2.95	2	4.33

Lift and Release: You are able to disengage the internal splines while the insert remains stationary, allowing you to rotate the handle to the desired position. The internal conical spring returns the handle to re-engage the splines for tightening or loosening.

Handle Material Available in Diecast Zinc or PA6 Thermoplastic
 Stud, Screw and Spring Made From 303 Stainless Steel
 Instantly Adjustable to 20-45 Different Handle Positions Depending on Size
 Handle Color is Black. Orange Available as Special Order
 Now available in 100% Solid Stainless Steel version

A standard clamping lever that also has an adjustable feature. Five sizes to fit a wide range of applications.

Special tapped or reamed holes are also available on request.

Knobs & Handles

Fine Grained High Strength Aluminum

Black Powder Coated

Revolving Steel and Duroplast Handle

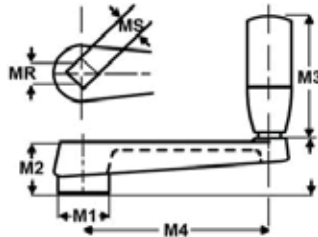
Hole for Handle is Tapped in Crank for Easy Removal or Insertion.

Superior in Appearance and Workmanship

NEW! Crank Handles - Revolving

Aluminum Crank with Revolving Handle

Part No.	Size (Inch)	MR Ream	MR Square	M1	M2	M3	M4
82117	1	3/8	---	0.9	0.94	1.97	3.15
82118	1	---	3/8	0.9	0.94	1.97	3.15
82119	2	1/2	---	1.05	1.1	2.56	3.93
82120	2	---	1/2	1.05	1.1	2.56	3.93
82121	3	5/8	---	1.25	1.34	3.15	4.92
82122	3	---	5/8	1.25	1.34	3.15	4.92
82123	4	5/8	---	1.38	1.5	3.15	6.3
82124	4	---	5/8	1.38	1.5	3.15	6.3
82125	4	3/4	---	1.38	1.5	3.15	6.3
82126	4	---	3/4	1.38	1.5	3.15	6.3



NEW! Metric - Revolving

Part No.	Size (Inch)	MR Ream	MR Square	M1	M2	M3	M4
82127	1	10	---	23	24	51	80
82128	1	---	10	23	24	51	80
82129	2	12	---	27	28	67	100
82130	2	---	12	27	28	67	100
82131	3	14	---	32	34	80	125
82132	3	---	14	32	34	80	125

NEW! Crank Handles - Fold Away

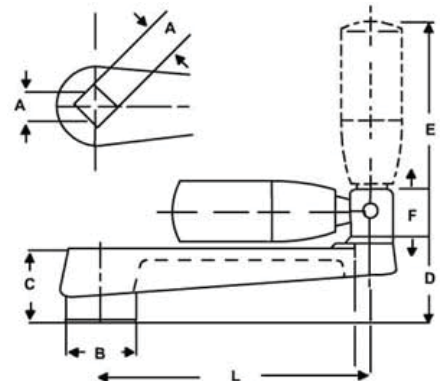
Aluminum Crank with Fold Away Handle

Part No.	Size (Inch)	A Ream	A Square	B	C	D	E	F	L
82133	2	1/2	---	1.06	1.1	1.25	3.15	.59	3.94
82134	2	---	1/2	1.06	1.1	1.25	3.15	.59	3.94
82135	3	5/8	---	1.25	1.34	1.58	3.92	.77	4.92
82136	3	---	5/8	1.25	1.34	1.58	3.92	.78	4.92
82137	4	5/8	---	1.38	1.5	1.73	3.92	.79	6.3
82138	4	---	5/8	1.38	1.5	1.73	3.92	.80	6.3
82139	4	3/4	---	1.38	1.5	1.73	3.92	.81	6.3
82140	4	---	3/4	1.38	1.5	1.73	3.92	.82	6.3



NEW! Metric - Fold Away

Part No.	Size (Inch)	A Ream	A Square	B	C	D	E	F	L
82141	2	12	---	27	28	32	80	15	100
82142	2	---	12	27	28	32	80	15	100
82143	3	14	---	32	34	40	100	20	125
82144	3	---	14	32	34	40	100	20	125



Black Powder Coated Aluminum

Manual Fold-A-Way Handle for Safety

To Engage Handle, Pull and it will snap into Position.

To Disengage, Pull up Handle then Push toward Crank Axis.



Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing

Northwestern



Thread Inserts

Re-Nu Thread™ Inserts

Re-Nu Thread™ Inserts are used in magnesium, aluminum, cast iron, copper, masonite and plastics. For loading bearing threads in any material.

Re-Nu Thread™ Inserts will not back out or vibrate loose. A locking element in the external thread automatically locks the insert in place. Bolts and screws can be inserted and removed without insert movement.

We recommend a 90 degree countersink 1/32" larger than the major diameter of the mating thread to prevent damaging the element.



Re-Nu Thread™ Inserts are left soft to allow altering.

An inexpensive threaded insert designed to be an easy method of repairing damaged threads.

No Special Tools Needed. Re-Nu Thread™ Inserts have standard external threads that permit the use of standard drills and taps.

1. Drill hole, countersink. Tap drill size given in dimension charts.
2. Tap hole same size as external thread.
3. Turn insert into place with a bolt and lock nut. Locking element holds in place.



Steel					
Zinc Plate Finish Nylon Pellet Locking Element					
Part No.	Internal Thread	External Thread	Length	Tap Drill Size	Net lbs Per 100
29001	10-24	3/8-16	13/32	5/16	3/4
29002	10-32	3/8-16	13/32	5/16	3/4
29003	1/4-20	7/16-14	7/16	U	1
29004	1/4-28	7/16-14	7/16	U	1
29005	5/16-18	1/2-13	31/64	27/64	1-1/4
29006	5/16-24	1/2-13	31/64	27/64	1-1/4
29007	3/8-16	9/16-12	33/64	31/64	1-1/2
29008	3/8-24	9/16-12	33/64	31/64	1-1/2
29009	7/16-14	5/8-11	21/32	17/32	2
29010	1/2-13	3/4-10	21/32	21/32	3-1/2
29011	1/2-20	3/4-10	21/32	21/32	3-1/4
29012	5/8-11	7/8-9	11/16	49/64	4-1/2
29013	5/8-11	7/8-9	1-1/8	49/64	7-1/2
29014	3/4-10	1-8	25/32	7/8	5-3/4
29015	1-8	1-3/8-12	1-1/4	1-19/64	23-1/2

Stainless Steel					
Type 303 Nylon Patch Locking Element					
Part No.	Internal Thread	External Thread	Length	Tap Drill Size	Net lbs Per 100
29101	4-40	10-32	7/32	21	1/4
29102	6-32	12-28	1/4	14	1/4
29103	8-32	1/4-28	9/32	3	1/4
29104	10-24	5/16-24	5/16	I	1/2
29105	10-32	5/16-24	5/16	I	1/2
29106	1/4-20	3/8-24	3/8	Q	1/2
29107	1/4-28	3/8-24	3/8	Q	1/2
29108	5/16-18	7/16-20	7/16	25/64	3/4
29109	5/16-24	7/16-20	7/16	25/64	3/4
29110	3/8-16	1/2-20	15/32	29/64	1
29111	3/8-24	1/2-20	15/32	29/64	1
29112	7/16-14	9/16-18	17/32	33/64	1-1/4
29113	7/16-20	9/16-18	17/32	33/64	1-1/4
29114	1/2-13	5/8-18	19/32	37/64	1-3/4
29115	1/2-20	5/8-18	19/32	37/64	1-1/2
29116	5/8-11	3/4-16	11/16	11/16	2-1/2
29117	5/8-18	3/4-16	11/16	11/16	2-1/4

Metric Internal / Metric External								
Steel - Black Oxide Finish or Stainless Nylon Pellet Locking Element								
Steel Part No.	Stainless Steel Part No.	Internal Thread 6H (2B)	External Thread 6g (2A)	Length mm	Length Inch	Tap Drill Size		Net lbs Per 100
29201	29221	M3 x 0.5	M6 x 1.0	6.5	.256	5.0	9	1/4
29202	29222	M4 x 0.7	M8 x 1.25	7.5	.296	6.75	H	1/2
29203	29223	M5 x 0.8	M8 x 1.25	7.5	.296	6.75	H	1/2
29204	29224	M6 x 1.0	M10 x 1.5	10.5	.414	8.5	Q	3/4
29205	29225	M8 x 1.25	M12 x 1.75	12.5	.493	10.0	Y	1
29206	29226	M10 x 1.5	M16 x 2.0	17.0	.670	14.0	35/64	2-3/4
29207	29227	M12 x 1.75	M16 x 2.0	17.0	.670	14.0	35/64	2
29208		M14 x 2.0	M20 x 2.5	18.0	.709	17.5	11/16	3-3/4
29209	29229	M16 x 2.0	M24 x 3.0	20.0	.788	21.0	53/64	6-1/2

Metric Class 6g/6H threads are suitable for applications where inch series Class 2A/2B were used.

* Closest inch drill Approx. 75% thread

Metric Internal / Inch External					
Steel - Black Oxide Finish Nylon Pellet Locking Element					
Part No.	Int. Thread 6H (2B)	External Thread	Length	Tap Drill Size	Net lbs Per 100
29301	M3 x 0.5	12-24	1/4	16	1/4
29302	M4 x 0.7	1/4-28	9/32	3	1/2
29303	M5 x 0.8	5/16-18	5/16	F	1/4
29304	M6 x 1.0	3/8-16	13/32	5/16	1/2
29305	M8 x 1.25	1/2-13	31/64	27/64	1-1/4
29306	M10 x 1.5	9/16-12	33/64	31/64	1-1/4
29307	M12 x 1.75	3/4-10	21/32	21/32	3-3/4
29308	M14 x 2.0	7/8-9	11/16	49/64	2-3/4
29309	M16 x 2.0	1-8	25/32	7/8	8
29310	M11 x 1.5	5/8-11	19/32	17/32	2-1/2
29016	M14 x 1.25	7/8-14	11/16	13/16	6
29017	M18 x 1.5	1-14	25/32	15/16	7-1/4

Re-Nu Thread™ Repair Kits

Steel				
Zinc Plate Finish Kit No. 30001 Coarse Internal / Coarse External				
Kit Consists of Quantity	Insert	Internal Thread	External Thread	Net lbs Per Kit
8	29001	10-24	3/8-16	1-1/2
8	29003	1/4-20	7/16-14	
8	29005	5/16-18	1/2-13	
6	29007	3/8-16	9/16-12	
6	29010	1/2-13	3/4-10	
4	29012	5/8-11	7/8-9	
4	29014	3/4-10	1-8	
Zinc Plate Finish Kit No. 30002 Fine Internal / Coarse External				
Kit Consists of Quantity	Insert	Internal Thread	External Thread	Net lbs Per Kit
8	29002	10-32	3/8-16	1-1/2
8	29004	1/4-28	7/16-14	
8	29006	5/16-24	1/2-13	
6	29008	3/8-24	9/16-12	
6	29011	1/2-20	3/4-10	
4	29016	M14 x 1.25	*7/8-14	
4	29017	M18 x 1.5	*1-14	
Black Oxide Finish Kit No. 30201 Metric Internal / Metric External				
Kit Consists of Quantity	Insert	Internal Thread	External Thread	Net lbs Per Kit
10	29202	M4 x 0.7	M8 x 1.25	1-1/2
10	29203	M5 x 0.8	M8 x 1.25	
10	29204	M6 x 1.0	M10 x 1.5	
10	29205	M8 x 1.25	M12 x 1.75	
8	29206	M10 x 1.5	M16 x 2.0	
6	29207	M12 x 1.75	M16 x 2.0	
4	29209	M16 x 2.0	M24 x 3.0	
Black Oxide Finish Kit No. 30301 Metric Internal / Inch External				
Kit Consists of Quantity	Insert	Internal Thread	External Thread	Net lbs Per Kit
10	29302	M4 x 0.7	1/4-28	1-1/2
10	29303	M5 x 0.8	5/16-18	
10	29304	M6 x 1.0	3/8-16	
10	29305	M8 x 1.25	1/2-13	
8	29306	M10 x 1.5	9/16-12	
6	29307	M12 x 1.75	3/4-10	
4	29309	M16 x 2.0	1-8	

Because special tools are not needed for Re-Nu Thread™ installation, these kits provide a quick, easy way to repair a wide range of threaded holes in many materials.

Contains assorted sizes and quantities of the most popular Re-Nu Thread™ Inserts.

Refills for the kits or any size Re-Nu Thread™ Inserts can be purchased separately, page 74.

*Fine Thread.

Type 303 Stainless Steel				
Kit No. 30101 Coarse Internal / Fine External				
Kit Consists of Quantity	Insert	Internal Thread	External Thread	Net lbs Per Kit
8	29104	10-24	5/16-24	1
8	29106	1/4-20	3/8-24	
8	29108	5/16-18	7/16-20	
8	29110	3/8-16	1/2-20	
6	29112	7/16-14	9/16-18	
6	29114	1/2-13	5/8-18	
4	29116	5/8-11	3/4-16	
Kit No. 30102 Fine Internal / Fine External				
Kit Consists of Quantity	Insert	Internal Thread	External Thread	Net lbs Per Kit
8	29105	10-32	5/16-24	1
8	29107	1/4-28	3/8-24	
8	29109	5/16-24	7/16-20	
8	29111	3/8-24	1/2-20	
6	29113	7/16-20	9/16-18	
6	29115	1/2-20	5/8-18	
4	29117	5/8-18	3/4-16	
Kit No. 30202 Metric Internal / Metric External				
Kit Consists of Quantity	Insert	Internal Thread	External Thread	Net lbs Per Kit
10	29222	M4 x 0.7	M8 x 1.25	1-1/2
10	29223	M5 x 0.8	M8 x 1.25	
10	29224	M6 x 1.0	M10 x 1.5	
10	29225	M8 x 1.25	M12 x 1.75	
8	29226	M10 x 1.5	M16 x 2.0	
6	29227	M12 x 1.75	M16 x 2.0	
4	29229	M16 x 2.0	M24 x 3.0	



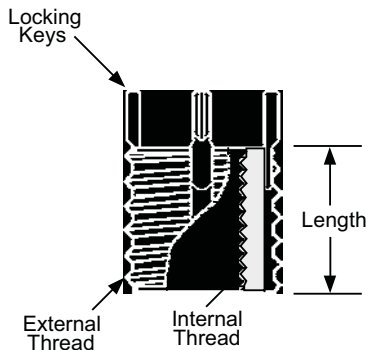
Packaged in a convenient, sturdy, styrene box for use in home, shop or field.

Keylocking Re-Nu Threads™

Heavy Duty

Industrial Style

Carbon Steel Part No.	Stainless Steel Part No.	Internal Thread Class 2B	External Thread (Mod.) Class 2A	Length
81388A	81412	8-32	5/16-18	.31
81389A	81413	10-24	3/8-16	.31
81390A	81414	10-32	3/8-16	.31
81391A	81415	1/4-20	7/16-14	.37
81392A	81416	1/4-28	7/16-14	.37
81393A	81417	5/16-18	1/2-13	.43
81394A	81418	5/16-24	1/2-13	.43
81395	81419	3/8-16	9/16-12	.50
81396	81420	3/8-24	9/16-12	.50
81397	81421	7/16-14	5/8-11	.62
81398	81422	7/16-20	5/8-11	.62
81399	81423	1/2-13	3/4-16	.62
81400	81424	1/2-20	3/4-16	.62
81401	-	9/16-12	3/4-16	.81
81402	-	9/16-18	3/4-16	.81
81403	-	5/8-11	7/8-14	.87
81404	-	5/8-18	7/8-14	.87
81405	-	3/4-10	1-1/8-12	1.12
81406	-	3/4-16	1-1/8-12	1.12
81407	-	7/8-9	1-1/8-12	1.25
81408	-	7/8-14	1-1/4-12	1.25
81409	-	1-8	1-1/8-12	1.37
81410	-	1-12	1-1/8-12	1.37
81411	-	1-14	1-1/8-12	1.37



Material: Inserts Carbon Steel - C1214 or equivalent
Stainless Steel - 303 or equivalent
Keys 302 CRES or equivalent

Finish: Carbon Steel - Zinc Phosphate
Stainless Steel - Passivated

Tolerances: +/- .010 inch unless specified otherwise

Dimensions: All Dimensions in Inches

Keys: Inserts with an internal thread size of 5/16 and larger have 4 locking keys. Smaller sizes have 2 locking keys.

Thinwall

Industrial Style

Carbon Steel Part No.	Stainless Steel Part No.	Internal Thread Class 2B	External Thread (Mod.) Class 2A	Length
81425	81437	10-24	5/16-18	.31
81426	81438	10-32	5/16-18	.31
81427	81439	1/4-20	3/8-16	.37
81428	81440	1/4-28	3/8-16	.37
81429	81441	5/16-18	7/16-14	.43
81430	81442	5/16-24	7/16-14	.43
81431	81443	3/8-16	1/2-13	.50
81432	81444	3/8-24	1/2-13	.50
81433	81445	7/16-14	9/16-12	.56
81434	81446	7/16-20	9/16-12	.56
81435	81447	1/2-13	5/8-11	.62
81436	81448	1/2-20	5/8-11	.62

Metric Thinwall

Industrial Style

Carbon Steel Part No.	Stainless Steel Part No.	Internal Thread Class 6H	External Thread (Mod.) Class 6g	Length
81449	81457	M5 X 0.8	M8 x 1.25	8.0
81450	81458	M6 X 1.0	M10 x 1.25	10.0
81451	81459	M8 X 1.25	M12 x 1.25	12.0
81452	81460	M8 X 1.25	M12 x 1.25	12.0
81453	81461	M10 X 1.25	M14 x 1.5	14.0
81454	81462	M10 X 1.5	M14 x 1.5	14.0
81455	81463	M12 X 1.25	M16 x 1.5	16.0
81456	81464	M12 X 1.75	M16 x 1.5	16.0

Material: Inserts Carbon Steel - C1215 or equivalent
Stainless Steel - 303 or equivalent
Keys 302 CRES or equivalent

Finish: Carbon Steel - Zinc Phosphate
Stainless Steel - Passivated

Tolerances: +/- .25 mm unless specified otherwise

Dimensions: All Dimensions in Millimeters

Keys: Inserts with an internal thread size of M8 and larger have 4 locking keys. Smaller sizes have 2 locking keys.



Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing

Northwestern



Fixturing, Locating & Leveling Pads

Toggle Shoe Clamps with Retaining Spring

With Hand Knob

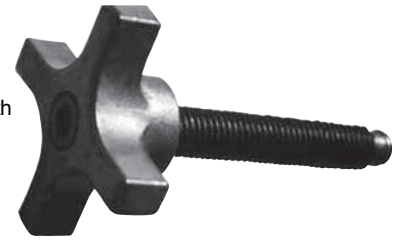
Part No.	Thread	*Overall Thread	Overall Length	t Knob Pt. No.	Hex A.F.	Net lbs Per 100
44001	1/4-20	1-3/16	1-13/16	17401	1/8	7
44002	1/4-20	1-15/16	2-9/16	17401	1/8	8
44003	1/4-20	2-11/16	3-5/16	17401	1/8	9
44004	1/4-20	3-7/16	4-1/16	17401	1/8	10
44005	5/16-18	1-1/4	2-1/8	17403	5/32	12
44006	5/16-18	2	2-7/8	17403	5/32	14
44007	5/16-18	2-3/4	3-5/8	17403	5/32	15
44008	5/16-18	3-1/2	4-3/8	17403	5/32	16
44009	3/8-16	1-1/4	2-1/4	17405	3/16	21
44010	3/8-16	2	3	17405	3/16	22
44011	3/8-16	2-3/4	3-3/4	17405	3/16	24
44012	3/8-16	3-1/2	4-1/2	17405	3/16	26
44013	3/8-16	4-1/4	5-1/4	17405	3/16	27
44014	1/2-13	2	3-1/8	17407	1/4	39
44015	1/2-13	2-3/4	3-7/8	17407	1/4	42
44016	1/2-13	3-1/2	4-5/8	17407	1/4	45
44017	1/2-13	4-1/4	5-3/8	17407	1/4	49
44018	1/2-13	5	6-1/8	17407	1/4	52
44019	5/8-11	2-1/4	3-1/2	17410	5/16	70
44020	5/8-11	3	4-1/4	17410	5/16	74
44021	5/8-11	3-3/4	5	17410	5/16	79
44022	5/8-11	4-1/2	5-3/4	17410	5/16	83
44023	5/8-11	5-1/4	6-1/2	17410	5/16	90

With Knurled Head

Part No.	Thread	*Overall Thread	Overall Length	Head Diameter	Hex A.F.	Net lbs Per 100
44101	1/4-20	1-3/8	1-13/16	11/16	1/8	3-1/2
44102	1/4-20	2-1/8	2-9/16	11/16	1/8	4-1/2
44103	1/4-20	2-7/8	3-5/16	11/16	1/8	5-1/4
44104	1/4-20	3-5/8	4-1/16	11/16	1/8	6
44105	5/16-18	1-5/8	2-1/8	3/4	5/32	5-3/4
44106	5/16-18	2-3/8	2-7/8	3/4	5/32	7
44107	5/16-18	3-1/8	3-5/8	3/4	5/32	8-1/2
44108	5/16-18	3-7/8	4-3/8	3/4	5/32	9-3/4
44109	3/8-16	1-3/4	2-1/4	7/8	3/16	10
44110	3/8-16	2-1/2	3	7/8	3/16	12
44111	3/8-16	3-1/4	3-3/4	7/8	3/16	14
44112	3/8-16	4	4-1/2	7/8	3/16	16
44113	3/8-16	4-3/4	5-1/4	7/8	3/16	17
44114	1/2-13	2-1/2	3-1/8	1	1/4	20
44115	1/2-13	3-1/4	3-7/8	1	1/4	23
44116	1/2-13	4	4-5/8	1	1/4	26
44117	1/2-13	4-3/4	5-3/8	1	1/4	30
44118	1/2-13	5-1/2	6-1/8	1	1/4	33
44119	5/8-11	2-3/4	3-1/2	1-1/8	5/16	32
44120	5/8-11	3-1/2	4-1/4	1-1/8	5/16	37
44121	5/8-11	4-1/4	5	1-1/8	5/16	43
44122	5/8-11	5	5-3/4	1-1/8	5/16	48
44123	5/8-11	5-3/4	6-1/2	1-1/8	5/16	54

* Overall Thread is from the end of the clamp to the last thread.

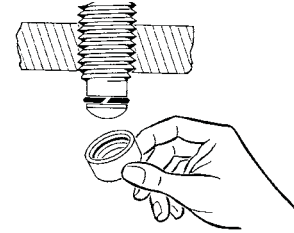
For solid clamping on angular surfaces. Special spring permits shoe to stop rotating on contact with work piece preventing marring of soft materials and finished surfaces.



See page 67 for knob dimensions.

Heat Treated Steel
Black Oxide Finish

Retaining spring passes thru tapped holes. Shoes snap on for quick assembly.



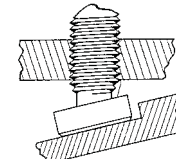
All Steel and Delrin® Shoes tilt 10° in any direction. Automatically adjust to uneven surfaces.

Use with Shoes on page 79.



Heat Treated Steel
Black Oxide Finish

Order separately.



With Socket

Part No.	Thread	*Overall Thread	Overall Length	Hex A.F.	Net lbs Per 100
44201	1/4-20	1-3/8	1-13/16	1/8	2
44202	1/4-20	2-1/8	2-9/16	1/8	2-1/2
44203	1/4-20	2-7/8	3-5/16	1/8	3-1/4
44204	1/4-20	3-5/8	4-1/16	1/8	4
44205	5/16-18	1-5/8	2-1/8	5/32	3-1/2
44206	5/16-18	2-3/8	2-7/8	5/32	4-1/2
44207	5/16-18	3-1/8	3-5/8	5/32	5-1/2
44208	5/16-18	3-7/8	4-3/8	5/32	7
44209	3/8-16	1-3/4	2-1/4	3/16	5-1/2
44210	3/8-16	2-1/2	3	3/16	7-1/2
44211	3/8-16	3-1/4	3-3/4	3/16	9-1/4
44212	3/8-16	4	4-1/2	3/16	12
44213	3/8-16	4-3/4	5-1/4	3/16	14
44214	1/2-13	2-1/2	3-1/8	1/4	14
44215	1/2-13	3-1/4	3-7/8	1/4	17
44216	1/2-13	4	4-5/8	1/4	20
44217	1/2-13	4-3/4	5-3/8	1/4	24
44218	1/2-13	5-1/2	6-1/8	1/4	27
44219	5/8-11	2-3/4	3-1/2	5/16	24
44220	5/8-11	3-1/2	4-1/4	5/16	29
44221	5/8-11	4-1/4	5	5/16	34
44222	5/8-11	5	5-3/4	5/16	40
44223	5/8-11	5-3/4	6-1/2	5/16	44

Shoes

Steel Shoes

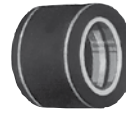
Standard Shoes

Part No.	Use With	Size	Net lbs Per 100
45201	1/4-20 Sizes	5/16 O.D. x 3/16	1/2
45202	5/16-18 Sizes	3/8 O.D. x 7/32	1/2
45203	3/8-16 Sizes	7/16 O.D. x 1/4	3/4
45204	1/2-13 Sizes	9/16 O.D. x 5/16	1-1/4
45205	5/8-11 Sizes	11/16 O.D. x 13/32	2-1/2

Large Shoes

45301	1/4-20 Sizes	5/8 O.D. x 7/32	1-3/4
45302	5/16-18 Sizes	11/16 O.D. x 1/4	2-1/2
45303	3/8-16 Sizes	3/4 O.D. x 9/32	3-1/4
45304	1/2-13 Sizes	7/8 O.D. x 3/8	5-1/2
45305	5/8-11 Sizes	1 O.D. x 7/16	7-3/4

Shoes are interchangeable with all three types of toggle shoe clamps of the same thread size.



Heat Treated Steel
Black Oxide Finish



All Steel and Delrin® Shoes tilt 10° in any direction. Automatically adjust to uneven surfaces.

Use with toggle shoe clamps on page 78.

Order separately.

Delrin® Shoes

Standard Shoes

Part No.	Use With	Size	Net lbs Per 100
45001	1/4-20 Sizes	5/16 O.D. x 3/16	1/4
45002	5/16-18 Sizes	3/8 O.D. x 7/32	1/4
45003	3/8-16 Sizes	7/16 O.D. x 1/4	1/4
45004	1/2-13 Sizes	9/16 O.D. x 5/16	1/4
45005	5/8-11 Sizes	11/16 O.D. x 13/32	1/2

Large Shoes

45101	1/4-20 Sizes	5/8 O.D. x 7/32	1/2
45102	5/16-18 Sizes	11/16 O.D. x 1/4	1/2
45103	3/8-16 Sizes	3/4 O.D. x 9/32	1/2
45104	1/2-13 Sizes	7/8 O.D. x 3/8	1
45105	5/8-11 Sizes	1 O.D. x 7/16	1-1/4



Recommended when clamping soft materials or finished surfaces. Tough Delrin® permits relatively high clamping pressures without danger of marring or scratching. Delrin® is resistant to oils, cutting fluids and most chemicals.

In addition to the standard components shown in this catalog, special sizes can also be furnished. Send print or drawing for quotation.

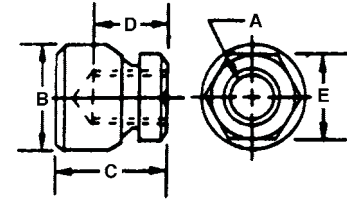
Ask for quoted price for 500 or more of any one item.

Toggle Pads

Part No.	A	B	C	D	E	Net lbs Per 100
45401	1/4-20	5/8	5/8	13/32	1/2	4
45402	5/16-18	11/16	3/4	27/64	9/16	5
45403	3/8-16	3/4	13/16	1/2	5/8	7
45404	1/2-13	7/8	15/16	17/32	3/4	10
45405	5/8-11	1	1	9/16	7/8	13
45406	3/4-10	1-1/4	1-5/16	3/4	1-1/16	27
45407	1-8	1-5/8	1-13/16	1	1-3/8	60



**Black Oxide Finish
Nut is Heat Treated**



10° swivel automatically adjusts to an uneven surface. Clamping force is directed squarely against work and prevents movement of work or clamping screw.

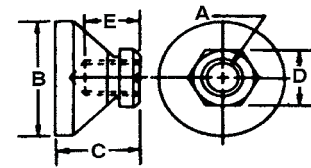
NEW SIZES!

Leveling Pads

Part No.	A	B	C	D	E	Net lbs Per 100
81649	10-32	0.75	0.53	0.38	0.17	12
81650	1/4-20	1	0.70	0.50	0.31	15
81651	5/16-18	1.25	0.88	0.63	0.63	19
45501	3/8-16	1-1/4	7/8	5/8	1/2	15
45502	1/2-13	1-7/8	1-1/8	3/4	17/32	40
45503	5/8-11	2-1/2	1-1/4	7/8	9/16	84
45504	3/4-10	3	1-3/8	1-1/16	3/4	150
81652	1-8	4	1.88	1.38	1.38	230



**Black Oxide Finish
Nut is Heat Treated**



10° swivel automatically adjusts to uneven surfaces, leveling machine tools, benches, etc. and prevents walking. Provides large surface area where heavy loads are to be applied to flexible or soft materials.

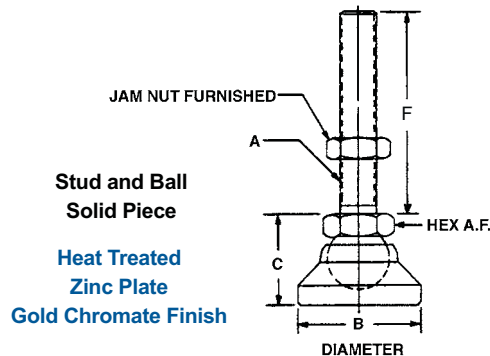
NEW SIZES!

Stud Type Leveling Pads

Part No.	A	B	C	Hex A.F.	F	Net lbs Per 100
81645	10-32	0.75	0.53	0.38	1	12
81646	1/4-20	1	0.70	0.50	1.25	15
81647	5/16-18	1.25	0.88	0.63	2	19
45521	3/8-16	1-1/4	7/8	5/8	2	23
45522	1/2-13	1-7/8	1-1/8	3/4	2	60
45523	5/8-11	2-1/2	1-1/4	7/8	2	115
45524	3/4-10	3	1-3/8	1-1/16	2	195
81648	1-8	4	1.88	1.38	6	230

All Sizes Conform to TCMAI Standards

10° swivel automatically adjusts to uneven surfaces, leveling machine tools, benches, etc. and prevents walking. Provides large surface area where heavy loads are to be applied to flexible or soft materials.



Rubber Pad For Leveling Pad

Part No.	For Use on Above Leveling Pads
45551	45501 and 45521
45552	45502 and 45522
45553	45503 and 45523
45554	45504 and 45524

These rubber pads are used on above leveling pads to reduce any walking or vibrating when machine is on. Just slip over the base of the pad and install leveling pad on machine.

PATENT PENDING



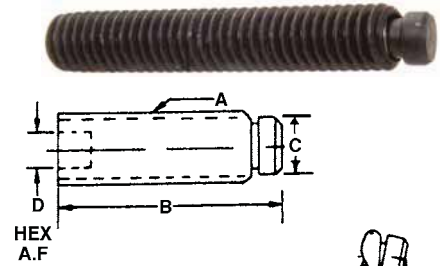
Material - Polyvinyl Chloride

NOTE: This pad can also be used on the Hi-Rise Base on Page 49.

Hex Socket Toggle Screws

Steel Pad	Delrin® Pad						
Part No.	Part No.	A	B	C	D	Net lbs Per 100	
44501	44551	1/4-20	1/2	.185	1/8	1/2	
44502	44552	1/4-20	3/4	.185	1/8	3/4	
44503	44553	1/4-20	1	.185	1/8	1	
44506		5/16-18	1	.245	5/32	1-1/2	
44507		5/16-18	1-1/2	.245	5/32	2-1/4	
44508		5/16-18	2	.245	5/32	3-1/4	
44509		3/8-16	3/4	.297	3/16	1-1/2	
44511		3/8-16	1-1/2	.297	3/16	3-1/4	
44512		3/8-16	2	.297	3/16	4-1/2	
44513		1/2-13	1	.405	1/4	3-1/4	
44515		1/2-13	2	.405	1/4	8	
44516		1/2-13	2-1/2	.405	1/4	10	
44517		5/8-11	2	.500	5/16	12	
44519		5/8-11	3	.500	5/16	19	

All Parts Conform to TCMAI Standards



Pads will pass thru tapped holes.

Pads stop rotating on contact with work piece. Prevents marring. 7° tilt allows for full contact with angular surfaces. Full clamping force is directed squarely against the part. Prevents work movement.

Delrin® is resistant to oils, cutting fluids and most chemicals.

PATENT NO. 2,845,828

Knurled Head Toggle Screws

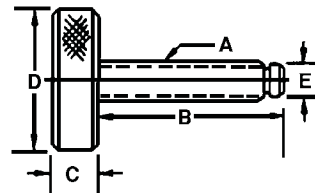
Steel Pad	Delrin® Pad						
Part No.	Part No.	A	B	C	D	E	Net lbs Per 100
44601	44651	1/4-20	1-1/2	5/16	1	.185	8
44602	44652	1/4-20	2	5/16	1	.185	9
44603		5/16-18	1-1/2	3/8	1-1/8	.245	13
44604		5/16-18	2	3/8	1-1/8	.245	14
44605		5/16-18	2-1/2	3/8	1-1/8	.245	15
44606		3/8-16	1-1/2	7/16	1-1/4	.297	19
44608		3/8-16	2-1/2	7/16	1-1/4	.297	21
44609		3/8-16	3	7/16	1-1/4	.297	22
44611		1/2-13	2	1/2	1-1/4	.405	26
44613		1/2-13	3	1/2	1-1/4	.405	31

All Parts Conform to TCMAI Standards

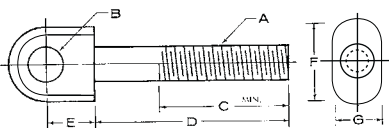
Has fine knurl for operator ease.



Heat Treated Steel
Black Oxide Finish



Heat Treated Steel
Black Oxide Finish



Swing bolts are not recommended for lifting applications. See Hoist Rings on pages 102-112 for your lifting needs.

Swing Bolts (Latch Bolts)

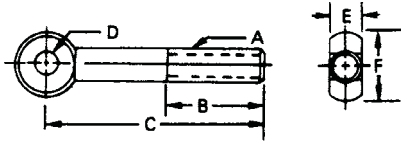
Part No.	Ref. No.	A	B	C	D	E	F	G	Net lbs Per 100
* 21001	14-LB	1/4-20	1/4	3/4	1-3/16	5/16	1/2	5/16	3
* 21002	56-LB	5/16-18	5/16	1	1-5/8	3/8	5/8	3/8	6
* 21003	38-LB	3/8-16	3/8	1-3/8	2	1/2	3/4	1/2	12
* 21004	12-LB	1/2-13	1/2	1-3/4	2-1/2	5/8	1	5/8	26
* 21005	58-LB	5/8-11	5/8	1-3/4	2-3/4	3/4	1-1/4	3/4	46
Long Type									
21101	14-LLB	1/4-20	1/4	1-1/4	2-3/16	5/16	1/2	5/16	5
21102	56-LLB	5/16-18	5/16	1-3/8	2-5/8	3/8	5/8	3/8	8
21103	38-LLB	3/8-16	3/8	2	3	1/2	3/4	1/2	15
* 21104	12-LLB	1/2-13	1/2	2-1/4	3-1/2	5/8	1	5/8	31
* 21105	58-LLB	5/8-11	5/8	2-1/2	4	3/4	1-1/4	3/4	58

* Conform to TCMAI Standards

Stainless Steel Available, Page 81



**Alloy Steel
Black Oxide Finish**



Used as a stationary hinge point for cams or similar items and in applications where the bolt must pivot.

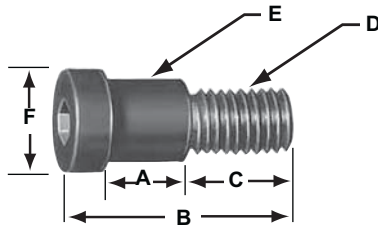
Eye bolts are not recommended for lifting applications. See Hoist Rings on pages 102-112 for your lifting needs.

Stainless Steel Available, Page 57

Eye Bolts (Tooling)

Part No.	A	B	C	D	E	F	Net lbs Per 100
21201	1/4-20	3/4	2	3/16	1/4	1/2	3
21202	1/4-20	1-1/4	3	3/16	1/4	1/2	5
21203	5/16-18	1-1/2	3	1/4	5/16	5/8	7
21204	5/16-18	2	4	1/4	5/16	5/8	9
21205	5/16-18	1-1/2	3	5/16	5/16	5/8	7
21206	5/16-18	2	4	5/16	5/16	5/8	9
21207	3/8-16	1-1/2	3	5/16	3/8	3/4	10
21208	3/8-16	1-1/2	3	3/8	3/8	3/4	10
21209	3/8-16	2	3-3/4	3/8	3/8	3/4	12
21210	3/8-16	2-1/2	5	3/8	3/8	3/4	15
21211	1/2-13	1-1/2	3-3/4	3/8	1/2	1	25
21212	1/2-13	2	5	3/8	1/2	1	31
21213	5/8-11	2	4-1/2	5/8	5/8	1-1/4	43
21214	5/8-11	2-1/2	6	5/8	5/8	1-1/4	56
21215	3/4-10	2	4-1/2	3/4	3/4	1-1/2	66
21216	3/4-10	2-1/2	6	3/4	3/4	1-1/2	83

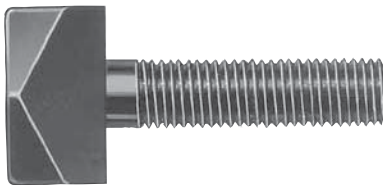
All Parts Conform to TCMAI Standards



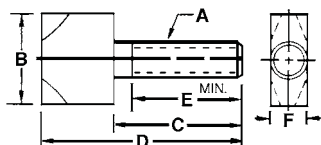
Black Oxide Finish

Chamfered corners quickly align screw with slot in lids, covers or plates.

Stainless Steel Available, Page 60



Black Oxide Finish



Socket Head Shoulder Screws

Part No.	Ref. No.	A	B	C	D	E	F	Net lbs Per 100
31001	1414	1/4	13/16	3/8	1/4-20	3/8	5/8	3
31002	1456	5/16	7/8	3/8	1/4-20	3/8	5/8	3
31003	5638	3/8	1-1/8	1/2	5/16-18	1/2	3/4	6
31004	3812	1/2	1-3/8	5/8	3/8-16	1/2	3/4	7

Use as a pivot or hinge point also as a guide for sliding parts.

Stainless Steel Available, Page 55

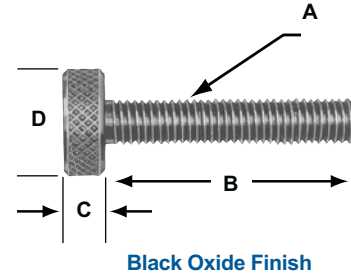
Quarter Turn Screws

Soft Part No.	Hardened Part No.	A	B	C	D	E	F	Net lbs Per 100
* 25001	25001H	10-32	1/2	1	1-1/2	7/8	3/16	2
25002	25002H	10-24	1/2	1	1-1/2	7/8	3/16	2
* 25003	25003H	1/4-20	3/4	1-1/4	1-7/8	1	1/4	5
* 25004	25004H	5/16-18	1	1-1/2	2-1/4	1-1/4	5/16	9
* 25005	25005H	3/8-16	1	1-1/2	2-1/2	1-1/4	3/8	15
* 25006	25006H	1/2-13	1-1/4	1-3/4	2-3/4	1-1/2	1/2	26
Long Type								
25101	25101H	10-32	1/2	1-1/2	2	1-3/8	3/16	3
25102	25102H	10-24	1/2	1-1/2	2	1-3/8	3/16	3
25103	25103H	1/4-20	3/4	1-3/4	2-3/8	1-1/2	1/4	6
25104	25104H	5/16-18	1	2	2-3/4	1-3/4	5/16	10
25105	25105H	3/8-16	1	2	3	1-3/4	3/8	16
25106	25106H	1/2-13	1-1/4	2-1/4	3-1/4	2	1/2	31

*Conform to TCMAI Standards

Knurled Head Screws

Part No.	Ref. No.	A	B	C	D	Net lbs Per 100
20001	400-15	10-24	1-1/2	3/16	5/8	3
20002	500-25	1/4-20	2-1/2	7/32	11/16	5
20003	600-3	5/16-18	3	1/4	3/4	9
20004	700-3	3/8-16	3	5/16	7/8	13
20005	800-3	1/2-13	3	3/8	1	22



For light duty clamping. Diamond knurl prevents finger slippage during tightening. Left soft for altering.

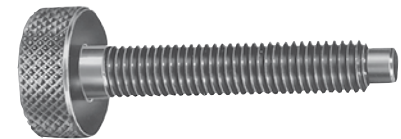
Stainless Steel Available, Page 58

Knurled Head Screws (Dog Point)

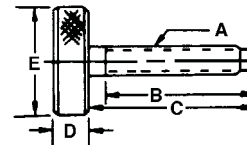
Part No.	A	B	C	D	E	Net lbs Per 100
20101	10-24	3/4	1	1/4	3/4	3-1/2
20102	10-24	1-1/4	1-1/2	1/4	3/4	4
20103	10-24	1-3/4	2	1/4	3/4	4-1/2
20104	1/4-20	1-1/4	1-1/2	5/16	1	8-1/2
20105	1/4-20	1-3/4	2	5/16	1	8-3/4
20106	1/4-20	2-1/4	2-1/2	5/16	1	9-1/2
20107	5/16-18	1-1/4	1-1/2	3/8	1-1/8	13
20108	5/16-18	1-3/4	2	3/8	1-1/8	14
20109	5/16-18	2-1/4	2-1/2	3/8	1-1/8	15
20110	3/8-16	1-3/4	2	7/16	1-1/4	20
20112	3/8-16	2-3/4	3	7/16	1-1/4	23
20113	1/2-13	2-3/4	3	1/2	1-1/4	30

All Parts Conform to TCMAI Standards

Used where permanent location of one part in relation to another is desired. Point is usually spotted in hole or slot.



Heat Treated Steel
Black Oxide Finish



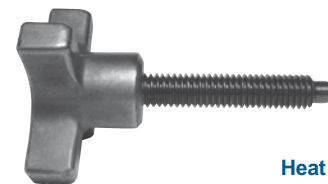
Hand Knob Screw Assemblies (Dog Point)

Part No.	A	B	C	D	Net lbs Per 100
20201	1/4-20	1	1-1/8	5/8	8
20202	1/4-20	1-1/2	1-1/8	5/8	9
20203	5/16-18	1-3/4	1-1/2	7/8	15
20204	5/16-18	2-1/2	1-1/2	7/8	16
20205	3/8-16	1-1/2	2	1-1/8	26
20206	3/8-16	2	2	1-1/8	27
20207	3/8-16	2-1/2	2	1-1/8	29
20208	1/2-13	1-1/2	2-1/2	1-1/2	47
20210	1/2-13	2-1/2	2-1/2	1-1/2	52
20211	1/2-13	3	2-1/2	1-1/2	54
20213	5/8-11	3	2-1/2	1-1/2	55

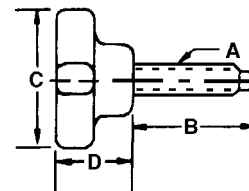
All Parts Conform to TCMAI Standards

Also available with Aluminum Knobs with same dimensions.
Please ask for prices.

For hand tightening. Hand knob reduces operator fatigue.

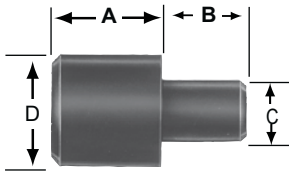


Heat Treated Steel
Black Oxide Finish



Fixturing, Locating & Leveling Pads

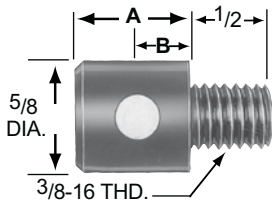
Used in jigs and fixtures to support or locate the work. Hardened .020 deep to allow for leveling grind.



Heat Treated Steel
Black Oxide Finish

Supports or locates work.

Used where a thru hole is impractical.

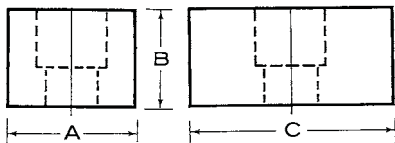


Hardened .020 Deep
Black Oxide Finish



Heat Treated Steel
Black Oxide Finish

Precision ground. Returns fixture to exact alignment.



Jig Feet and Rest Buttons

Press Type

Part No.	Ref. No.	A	B	C	D	Net lbs Per 100
19101	14-PF	1/4	1/2	.376	5/8	4
19102	38-PF	3/8	1/2	.376	5/8	5
19103	12-PF	1/2	1/2	.376	5/8	6
19104	58-PF	5/8	1/2	.376	5/8	7-1/4
19105	34-PF	3/4	1/2	.376	5/8	8-1/2
19106	10-PF	1	1/2	.376	5/8	11

Small Sizes

* 19107	14-BB	1/4	1/2	.251	1/2	2-1/4
* 19108	38-BB	3/8	1/2	.251	1/2	3
* 19109	12-BB	1/2	1/2	.251	1/2	4

Tiny Sizes

* 19110	14-AB	1/4	3/8	.188	3/8	1-1/4
* 19111	38-AB	3/8	3/8	.188	3/8	1-3/4
* 19112	12-AB	1/2	3/8	.188	3/8	2

*Conform to TCMAI Standards

Screw Type

Part No.	Ref. No.	A	B	Net lbs Per 100
19201	14-SF	1/4	1/8	3-1/4
19202	38-SF	3/8	3/16	4-1/4
19203	12-SF	1/2	1/4	5
19204	58-SF	5/8	1/4	6
19205	34-SF	3/4	1/4	7
19206	10-SF	1	1/4	9-1/2

Fixture Keys

Part No.	A	B	C	Screw Size	Net lbs Per 100
14001	.500	1/2	3/4	1/4	4
14002	.5625	1/2	3/4	1/4	5
14003	.625	1/2	3/4	5/16	5
14004	.6875	1/2	1	5/16	8
14005	.750	1/2	1-1/4	5/16	12
14006	.8125	1/2	1-1/4	5/16	13

All Parts Conform to TCMAI Standards

Ask for quoted price for 500 or more of any one item.

For more information, check out our website:

www.northwesternertools.com



Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing

Northwestern



Tooling Blocks

Tooling Blocks

Pallet fixtures, also known as tombstones, tombstone fixtures or tooling blocks, provide a solid base for mounting vises, fixtures, or sub-plates.

Made from one-piece, class 40 cast iron that has been stress-relieved.

Base and sides milled flat and square within 0.001" over 12". DIN mounting standard, JIS mounting optional.

All square columns have drilled and tapped lifting holes in the top surface and coolant drain holes at the base of the column.

Available standard as plain milled or custom made with your own hole pattern.

A large number of standard size castings in stock.

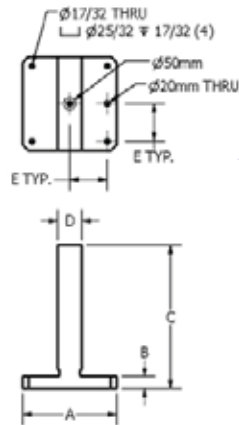
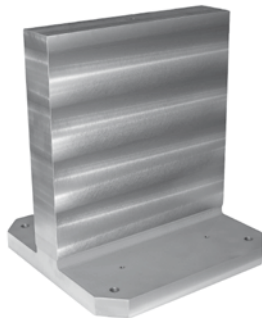
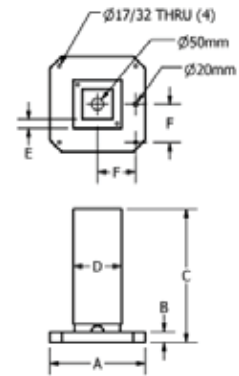
Other materials available on request.

NEW!

Tombstones

Square Column Pallet Fixtures

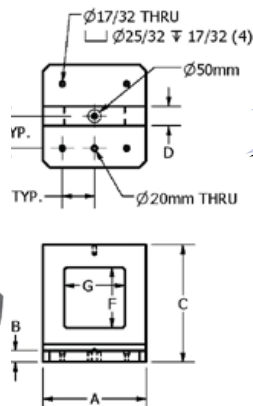
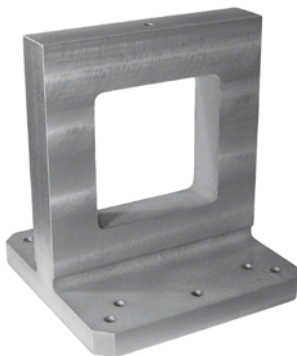
Part Number	A	B	C	D	E	F	Weight (lbs)
81000	400mm	1 -3/4	22	8	1-1/2	6.30	275
81001	400mm	2 -3/4	26	10	1-1/2	6.30	365
81002	500mm	2	22	8	1-1/2	7.87	360
81003	500mm	2	26	10	1-1/2	7.87	530



NEW!

T-Type Column Pallet Fixtures

Part Number	A	B	C	D	E	Weight (lbs)
81004	400mm	1-3/4	18	3	6.30	310
81005	400mm	1-3/4	24	4	6.30	480
81006	500mm	2	18	3	7.87	450
81007	500mm	2	24	4	7.87	660



NEW!

Window Type Pallet Fixtures

Part Number	A	B	C	D	E	F	G	Weight (lbs)
81008	400mm	1-3/4	18	3	6.30	9-1/4	9-1/4	245
81009	400mm	1-3/4	24	4	6.30	15-1/4	9-1/4	330
81010	500mm	2	18	3	7.87	9-1/4	12-3/4	355
81011	500mm	2	24	4	7.87	15-1/4	12-3/4	455



Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing



Grippers

NEW!

Square Grippers

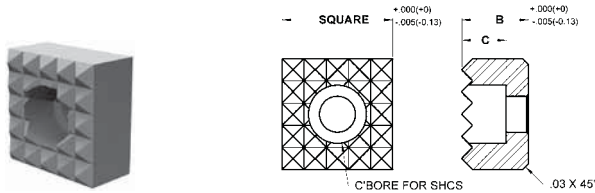
Square Grippers - Steel Serrated - Counter Bored Hole

Part Number	Square	B Height	C C'Bore Depth	C'Bore to fit	Tooth Pattern
82000	1/2	3/8	1/4	10 SHCS	Fine
82001	1/2	1/2	1/4	10 SHCS	Fine
82002	5/8	3/8	1/4	10 SHCS	Fine
82003	5/8	1/2	1/4	10 SHCS	Fine
82004	3/4	1/2	5/16	1/4 SHCS	Fine
82005	1	1/2	5/16	1/4 SHCS	Fine

Made from M-2 high speed steel and hardened to Rc 60/62 with black oxide finish.

Serrated for sure holding in tough applications.

Counter bored hole for front mounting with socket head cap screw.



NEW!

Square Grippers - Steel Serrated - Tapped Hole

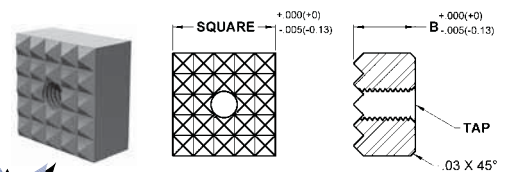
Part Number	Square	B Height	Tap	Tooth Pattern
82006	3/8	3/8	10-32	EF
82007	3/8	1/2	10-32	EF
82008	1/2	3/8	10-32	Fine
82009	1/2	1/2	10-32	Fine
82010	5/8	3/8	10-32	Fine
82011	5/8	1/2	10-32	Fine
82012	3/4	3/8	10-32	Fine
82013	3/4	1/2	10-32	Fine
82014	1	3/8	1/4-28	Fine
82015	1	1/2	1/4-28	Fine

Made from M2 high speed steel and hardened to Rc 60/62 with black oxide finish.

Serrated for sure holding in tough applications.

Thru-hole tap.

Other sizes and metric styles available.



Adjustable Grippers

Hex Head - Carbide Tipped

Part Number	A Shank Length	B Thread Length	Hex	D Hex Height	E Pad Diameter	Thread	Tooth Pattern
82016	1/2	1/2	13/64	7/16	5/16	1/4-20	EF
82017	1	1	13/64	7/16	5/16	1/4-20	EF
82018	1 1/2	7/8	13/64	7/16	5/16	1/4-20	EF
82019	1/2	1/2	1/4	1/2	3/8	5/16-18	Fine
82020	1	1	1/4	1/2	3/8	5/16-18	Fine
82021	1 1/2	1	1/4	1/2	3/8	5/16-18	Fine
82022	1/2	1/2	9/32	9/16	1/2	3/8-16	Fine
82023	1	1	9/32	9/16	1/2	3/8-16	Fine
82024	1 1/2	1 1/8	9/32	9/16	1/2	3/8-16	Fine
82025	1	1	23/64	3/4	5/8	1/2-13	Fine
82026	1 1/2	1 1/2	23/64	3/4	5/8	1/2-13	Fine
82027	1	1	7/16	15/16	3/4	5/8-11	Fine
82028	2	1 1/2	7/16	15/16	3/4	5/8-11	Fine

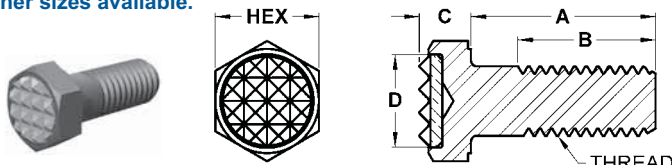
Made from alloy steel and hardened to Rc 32/37 with a black oxide finish.

The threaded body allows the user to adjust the height of the gripper.

The serrated carbide tip provides sure holding and long life.

The serrated carbide pad is brazed onto a pocket in the head.

Other sizes available.



NEW!

Threaded Body - Tool Steel

Part Number	Thread	A Length	B Int. Hex	Tooth Pattern
82029	3/8-16	1/2	1/8	EF
82030	3/8-16	1	1/8	EF
82031	3/8-16	1-1/2	1/8	EF
82032	1/2-13	1	3/16	Fine
82033	1/2-13	1-1/2	3/16	Fine
82034	5/8-11	1	1/4	Fine
82035	5/8-11	1-1/2	1/4	Fine
82036	3/4-10	1	5/16	Fine
82037	3/4-10	1-1/2	5/16	Fine

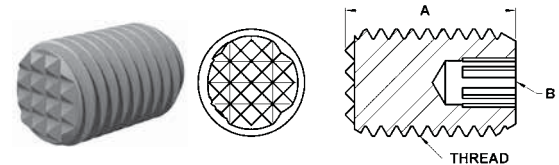
Made from M-2 high speed steel and hardened to Rc 55/58 with black oxide finish.

The threaded body allows the user to adjust the height of the gripper.

The serrated tip provides sure holding.

Internal hex allows for adjustment from the backside.

Other sizes including metric styles available.



NEW! Round Grippers

Round Grippers - Carbide Tipped Serrated - Tapped Hole

Part Number	Dia.	B Height	C Flat Pos.	D Flat Width	E Pad Dia.	Tap	Tooth Pattern
82068	3/8	3/8	11/64	3/16	5/16	10-32	EF
82069	3/8	1/2	15/64	3/16	5/16	10-32	EF
82070	1/2	1/2	15/64	3/16	3/8	10-32	Fine
82071	1/2	3/8	11/64	3/16	3/8	10-32	Fine
82072	1/2	.651	19/64	3/16	3/8	10-32	Fine
82073	5/8	3/8	11/64	3/16	1/2	1/4-28	Fine
82074	5/8	1/2	15/64	3/16	1/2	1/4-28	Fine
82075	3/4	3/8	11/64	3/16	5/8	1/4-28	Fine
82076	3/4	1/2	15/64	3/16	5/8	1/4-28	Fine
82077	1	3/8	11/64	3/16	3/4	1/4-28	Fine

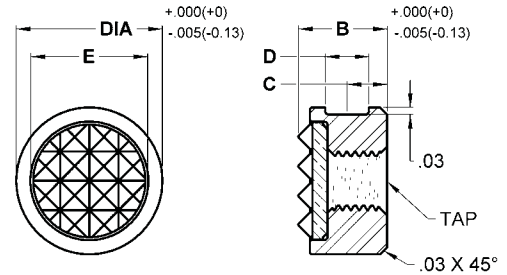
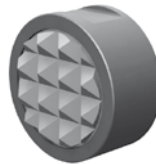
Made from alloy steel.

The serrated carbide tip provides sure holding and long life.

The serrated carbide pad is brazed onto a pocket in the head.

Blind-hole tap for back side mounting.

Flat on OD for set screw mounting.



NEW! Round Grippers - Steel Serrated - Tapped Hole

Round Grippers - Steel Serrated - Tapped Hole

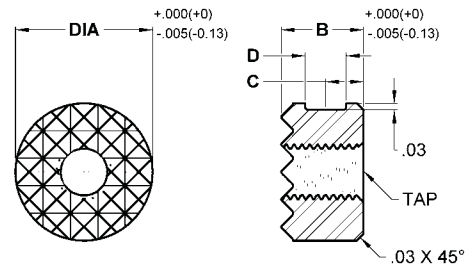
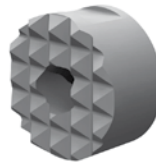
Part Number	Dia.	B Height	C Flat Pos.	D Flat Width	Tap Size	Tooth Pattern
82078	3/8	3/8	11/64	3/16	10-32	EF
82079	3/8	1/2	15/64	3/16	10-32	EF
82080	1/2	3/8	11/64	3/16	10-32	Fine
82081	1/2	1/2	15/64	3/16	10-32	Fine
82082	1/2	.651	19/64	3/16	10-32	Fine
82083	5/8	3/8	11/64	3/16	1/4-28	Fine
82084	5/8	1/2	15/64	3/16	1/4-28	Fine
82085	3/4	3/8	11/64	3/16	1/4-28	Fine
82086	3/4	1/2	15/64	3/16	1/4-28	Fine
82087	1	3/8	11/64	3/16	1/4-28	Fine
82088	1	1/2	15/64	3/16	1/4-28	Fine

Made from M2 high speed steel and hardened to Rc 60/62 with black oxide finish.

Serrated for sure holding in tough applications.

Thru-hole tap.

Flat on OD for set screw mounting.



NEW! Round Grippers - Steel Serrated - Counter Bored Hole

Round Grippers - Steel Serrated - Counter Bored Hole

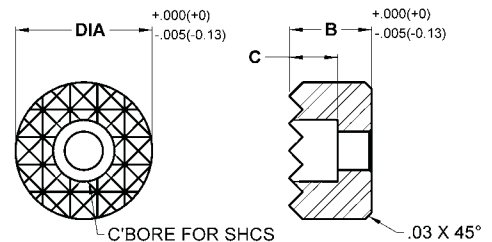
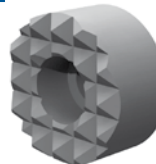
Part Number	Dia.	B Height	C C'Bore Depth	C'Bore to fit	Tooth Pattern
82089	1/2	3/8	7/32	8 SHCS	Fine
82090	1/2	1/2	7/32	8 SHCS	Fine
82091	5/8	3/8	7/32	8 SHCS	Fine
82092	5/8	1/2	7/32	8 SHCS	Fine
82093	3/4	3/8	1/4	10 SHCS	Fine
82094	3/4	1/2	1/4	10 SHCS	Fine
82095	1	1/2	5/16	1/4 SHCS	Fine

Made from M2 high speed steel and hardened to Rc 60/62 with black oxide finish.

Serrated for sure holding in tough applications.

Counter bored hole for front mounting with socket head cap screw.

Metric sizes available.

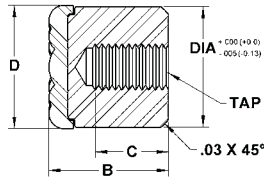
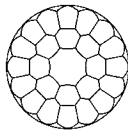




Grippers

Soft-Top Urethane Surface - Tapped Hole Round - Stainless Steel

Part Number	Pad Dia.	B Height	Tap	C Tap Depth	D Contact Dia.
82038	5/16	1/2	8-32	1/4	.315
82039	3/8	1/2	10-32	1/4	.394
82040	1/2	1/2	10-32	1/4	.512
82041	5/8	1/2	1/4-28	3/8	.630
82042	3/4	1/2	1/4-28	3/8	.827
82043	1	1/2	1/4-28	3/8	1.063



The urethane surface is permanently bonded to a 300 series stainless steel pad.

The non-marking, non-staining urethane provides excellent protection against damage on delicate work surfaces.

The "bubbled" texture of the urethane top offers firm holding and allows air to escape so no suction is created between the contact surface

Because the top is made of urethane it offers superior abrasion and wear resistance.

Blind-hole tap for back side mounting.

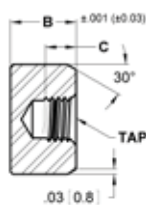
The urethane surface is a 60 durometer hardness.

Other durometers and sizes including metric are available.



Abrasive Diamond Surface - Tapped Hole Round - Stainless Steel

Part Number	Dia.	B Height	Tap	C Tap Depth
82044	5/16	3/8	8-32	3/16
82045	5/16	1/2	8-32	5/16
82046	3/8	3/8	10-32	3/16
82047	3/8	1/2	10-32	5/16
82048	1/2	3/8	10-32	3/16
82049	1/2	1/2	10-32	5/16
82050	5/8	3/8	1/4-28	3/16
82051	5/8	1/2	1/4-28	5/16
82052	3/4	3/8	1/4-28	3/16
82053	3/4	1/2	1/4-28	5/16
82054	1	3/8	1/4-28	3/16
82055	1	1/2	1/4-28	5/16



The abrasive surface is permanently fused to a stainless steel pad.

The surface texture is comparable to a 100 grit abrasive.

They are ideal for holding smooth or slippery applications with a minimum of clamping pressure and surface marking.

Individual diamond particles transfer holding pressure to a very small and well distributed area.

The diamond surface also provides unparalleled wear resistance.

The pad is made from 17-4 stainless steel and heat treated to Rc 43/46.

Blind-hole tap for back side mounting.

Metric Sizes are available.



Rest Pads

Stainless Steel - Trapped

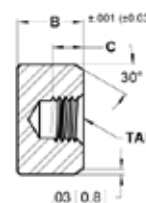
Part Number	Dia.	B Height	Tap	C Tap Depth
82056	5/16	3/8	8-32	3/16
82057	5/16	1/2	8-32	5/16
82058	3/8	3/8	10-32	3/16
82059	3/8	1/2	10-32	5/16
82060	1/2	3/8	10-32	3/16
82061	1/2	1/2	10-32	5/16
82062	5/8	3/8	1/4-28	3/16
82063	5/8	1/2	1/4-28	5/16
82064	3/4	3/8	1/4-28	3/16
82065	3/4	1/2	1/4-28	5/16
82066	1	3/8	1/4-28	3/16
82067	1	1/2	1/4-28	5/16

Made from 17-4 stainless steel and heat treated to Rc 43/46.

Provides high strength as well as protection against chemical and environmental corrosion.

Blind hold tap for back side mounting.

Metric sizes available.

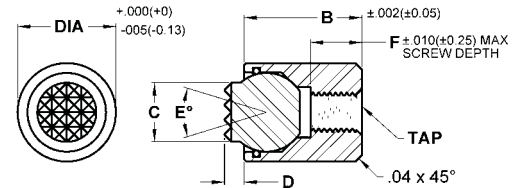


NEW! Replaceable Swivel Ball
Threaded Body - Steel Ball - Serrated

Part Number	Thread	B Thread Length	C Contact Dia.	D Stand Off	E Degree Swivel	F Hex	Ball Dia.	Tooth Pattern	Load Rating lbs
82601	3/8-16	1/2	5/32	1/16	28	3/16	3/16	SF	1,763
82602	3/8-16	1	5/32	1/16	28	3/16	3/16	SF	1,763
82603	3/8-16	2	5/32	1/16	28	3/16	3/16	SF	1,763
82604	1/2-13	3/4	1/4	1/16	28	1/4	9/32	SF	4,527
82605	1/2-13	1	1/4	1/16	28	1/4	9/32	SF	4,527
82606	1/2-13	2	1/4	1/16	28	1/4	9/32	SF	4,527
82607	1/2-13	3	1/4	1/16	28	1/4	9/32	SF	4,527
82608	5/8-11	1	5/16	1/16	28	5/16	3/8	EF	6,131
82609	5/8-11	2	5/16	1/16	28	5/16	3/8	EF	6,131
82610	5/8-11	3	5/16	1/16	28	5/16	3/8	EF	6,131



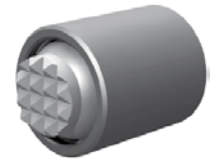
The replaceable serrated ball swivels to allow for better clamping on uneven surfaces. A Viton® o-ring holes the ball in place while keeping contaminants out and providing smooth ball movement. The housing is made from alloy steel, heat treated to Rc 43/46 with black oxide finish. The replaceable ball is made from M-2 high speed steel heat treated to Rc 60/62. Replacement balls can be ordered separately.



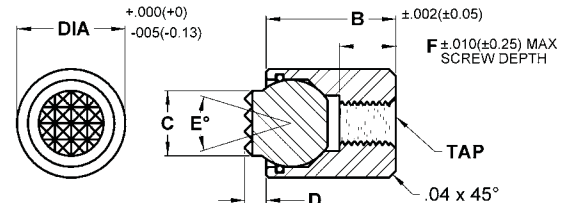
Other ball styles available.

NEW! Base Design Style - Steel Ball - Serrated

Part Number	Diameter	B Length	C Contact Dia.	D Stand Off	E Degree Swivel	Tap	F Thread Depth	Ball Dia.	Tooth Pattern	Load Rating lbs
82611	3/8	5/16	5/32	1/16	28	4-40	1/4	3/16	SF	1,835
82612	3/8	7/16	5/32	1/16	28	4-40	5/16	3/16	SF	1,835
82613	3/8	11/16	5/32	1/16	28	4-40	5/16	3/16	SF	1,835
82614	7/16	3/8	1/4	1/16	28	8-32	5/32	9/32	SF	3,339
82615	7/16	15/16	1/4	1/16	28	8-32	1/2	9/32	SF	3,339
82616	1/2	1/2	5/16	1/16	28	10-32	5/32	3/8	EF	4,697
82617	1/2	1	5/16	1/16	28	10-32	5/8	3/8	EF	4,697



Compact body allows for installation in tight areas. The housing is tapped for backside fastening. The replaceable serrated ball swivels to allow for better clamping on uneven surfaces. A Viton® o-ring holds the ball in place while keeping contaminants out and providing smooth ball movement. The housing is made from alloy steel, heat treated to Rc 43/46 with black oxide finish. The replaceable ball is made from M-2 high speed steel heat treated to Rc 60/62. Replacement balls can be ordered separately.



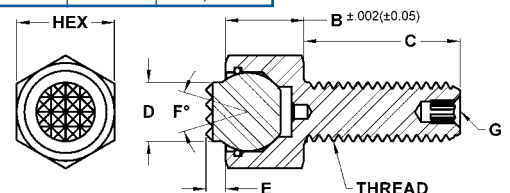
Other ball styles available.

NEW! Hex Head Design - Serrated

Part Number	Hex	B Head Height	C Thread Length	D Contact Dia.	E Stand Off	Thread Size	F Thread Depth	G Int Hex	Ball Dia.	Tooth Pattern	Load Rating lbs
82618	3/8	1/4	1/2	5/32	1/16	10-24	28	--	3/16	SF	1,176
82619	3/8	1/4	1	5/32	1/16	10-24	28	--	3/16	SF	1,176
82620	7/16	5/16	1/2	1/4	1/16	1/4-20	28	--	9/32	SF	2,441
82621	7/16	5/16	1	1/4	1/16	1/4-20	28	--	9/32	SF	2,441
82622	7/16	5/16	1-1/2	1/4	1/16	1/4-20	28	--	9/32	SF	2,441
82623	1/2	3/8	1/2	5/16	1/16	5/16-18	28	--	3/8	EF	2,792
82624	1/2	3/8	1	5/16	1/16	5/16-18	28	--	3/8	EF	2,792
82625	1/2	3/8	1-1/2	5/16	1/16	5/16-18	28	--	3/8	EF	2,792



The replaceable serrated ball swivels to allow for better clamping on uneven surfaces. A Viton® o-ring holds the ball in place while keeping contaminants out and providing smooth ball movement. The housing is made from alloy steel, heat treated to Rc 43/46 with black oxide finish. The replaceable ball is made from M-2 high speed steel heat treated to Rc 60/62. Replacement balls can be ordered separately.



Other ball styles available.

Swivots

NEW!

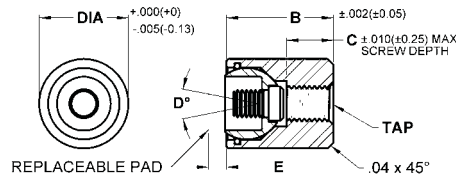
Base Design Body

Part Number	Dia.	B Length	C Screw Depth	D Degree Swivel	E* Stand Off 1	E* Stand Off 2	Ball Dia.	Replaceable Pad Dia. **	Tap Size	Load Rating lbs
82096	5/8	3/4	15/64	20	1/8	1/4	1/2	3/8	1/4-28	5,849
82097	13/16	7/8	11/32	24	1/8	1/4	5/8	1/2	5/16-24	10,925
82098	15/16	7/8	9/32	22	1/8	1/4	3/4	5/8	3/8-24	13,325
82099	1-1/8	15/16	17/64	20	1/8	1/4	7/8	3/4	1/2-20	18,863
82100	1-1/2	1-1/4	7/16	20	1/8	1/4	1-1/8	1	1/2-20	34,619

* F1 - Stand off with 3/8" height pad.

* F2 - Stand off with 1/2" height pad.

** Select any fixed gripper or rest pad with the proper diameter and tapped hole.



The replaceable pad swivels to allow for self-alignment on uneven surfaces.

Cylindrical body allows for installation in tight areas.

The housing is tapped for backside fastening.

The replaceable pad fits in a hardened (Rc 58/60) 440c stainless ball cup and is held in place with a lock screw.

The pad can be replaced when worn or a different style pad is required.

The housing is made from alloy steel, heat treated to Rc 43/46 with black oxide finish.

The parts below are for the Swivot assembly only and do not include a pad.

Pads must be ordered separately.

Metric sizes are available.

NEW!

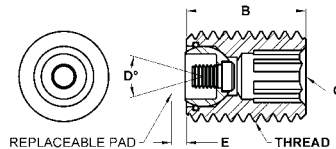
Threaded Body Design

Part Number	Thread	B Length	C Int. Hex	D Degree Swivel	E* Stand Off 1	E* Stand Off 2	Ball Dia.	Replaceable Pad Dia. **	Load Rating lbs
82112	3/4-10	1	3/8	20	1/8	1/4	1/2	3/8	8,150
82113	3/4-10	2	3/8	20	1/8	1/4	1/2	3/8	8,150
82114	3/4-10	3	3/8	20	1/8	1/4	1/2	3/8	8,150
82115	1-8	2	3/8	24	1/8	1/4	5/8	1/2	14,757
82116	1-8	3	3/8	24	1/8	1/4	5/8	1/2	14,757

* F1 - Stand off with 3/8" height pad.

* F2 - Stand off with 1/2" height pad.

** Select any fixed gripper or rest pad with the proper diameter and tapped hole.



NEW!

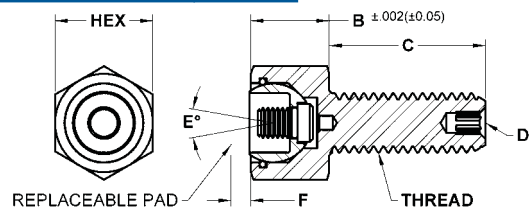
Hex Head Design

Part Number	Thread	B- Head Height	C Thread Length	D Int. Hex	E Degree Swivel	F* Stand Off 1	F* Stand Off 2	Ball Diameter	Replaceable Pad Dia. **	Hex Size	Load Rating lbs
82101	3/8-16	1/2	1/2	1/8	20	1/8	1/4	1/2	3/8	5/8	3,446
82102	3/8-16	1/2	1	1/8	20	1/8	1/4	1/2	3/8	5/8	3,446
82103	3/8-16	1/2	1-1/2	1/8	20	1/8	1/4	1/2	3/8	5/8	3,446
82104	1/2-13	5/8	1	3/16	24	1/8	1/4	5/8	1/2	13/16	5,937
82105	1/2-13	5/8	1-1/2	3/16	24	1/8	1/4	5/8	1/2	13/16	5,937
82106	5/8-11	11/16	1	1/4	22	1/8	1/4	3/4	5/8	15/16	9,932
82107	5/8-11	11/16	2	1/4	22	1/8	1/4	3/4	5/8	15/16	9,932
82108	3/4-10	3/4	1	5/16	20	1/8	1/4	7/8	3/4	1-1/8	14,862
82109	3/4-10	3/4	2-1/2	5/16	20	1/8	1/4	7/8	3/4	1-1/8	14,862
82110	1-8	1	2	3/8	20	1/8	1/4	1-1/8	1	1-1/2	28,158
82111	1-8	1	4	3/8	20	1/8	1/4	1-1/8	1	1-1/2	28,158

* F1 - Stand off with 3/8" height pad.

* F2 - Stand off with 1/2" height pad.

** Select any fixed gripper or rest pad with the proper diameter and tapped hole.

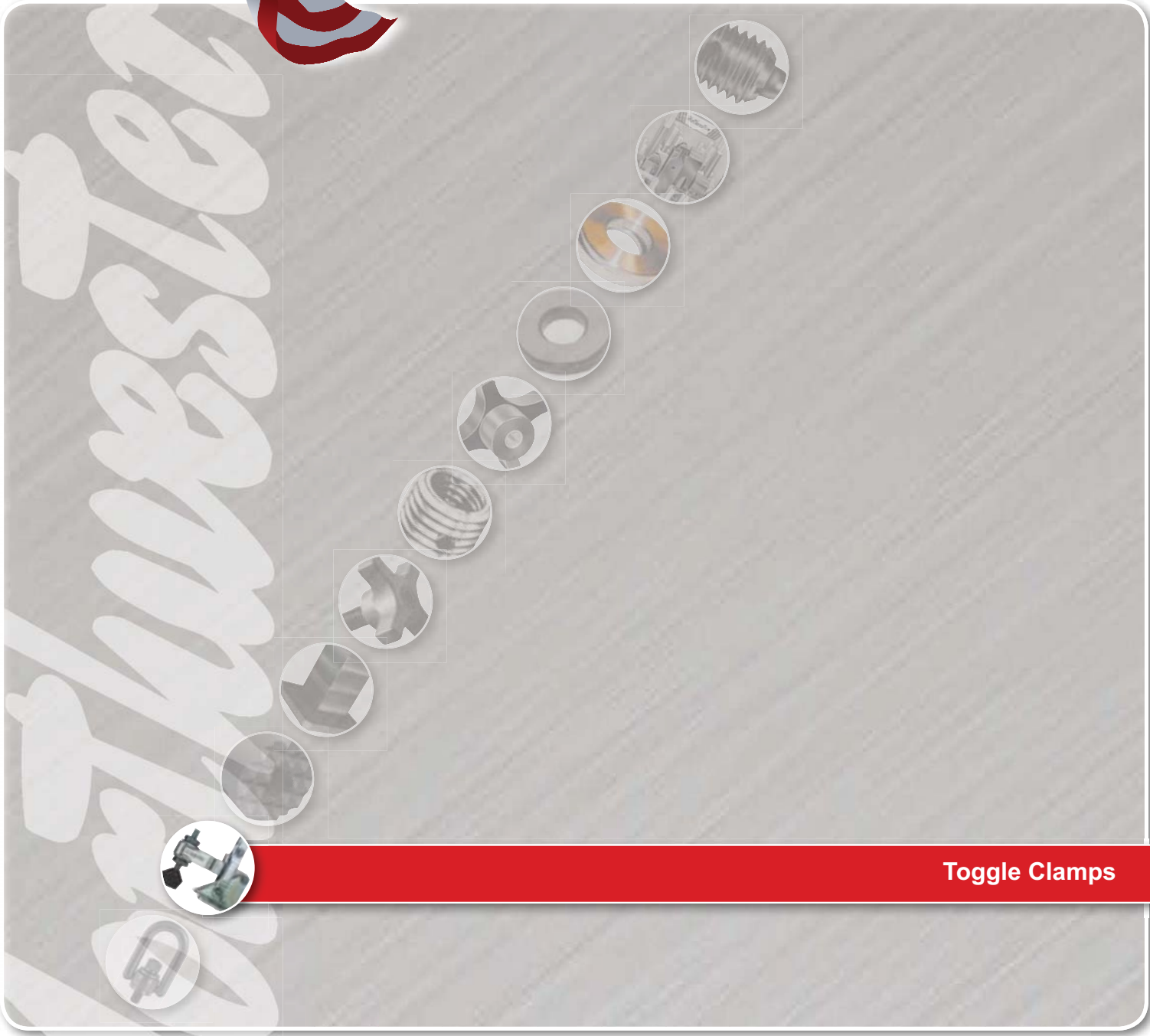


American Made Products for Work Holding and Fastener Applications



Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing



Toggle Clamps

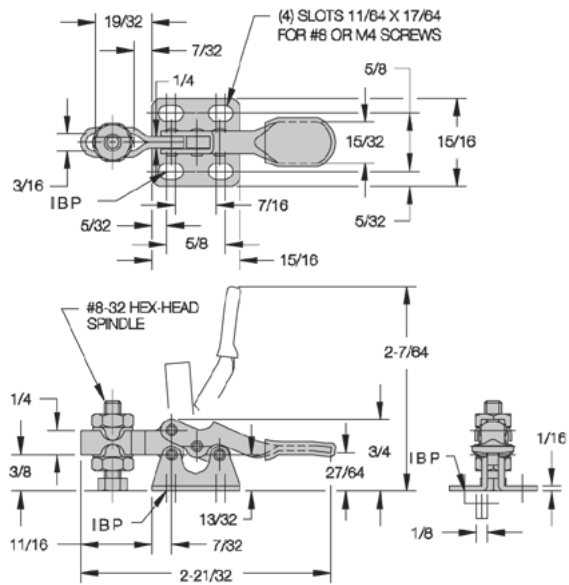
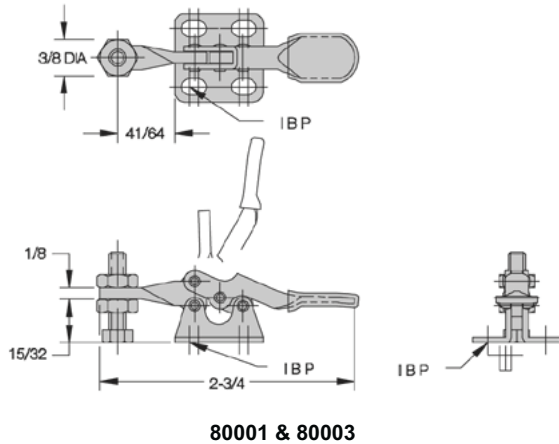
Toggle Clamps



Horizontal - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80001	Steel	Solid Arm, Flanged Base	60 lb
80002	Steel	Open Arm, Flanged Base	60 lb
80003	Stainless Steel	Solid Arm, Flanged Base	75 lb
80004	Stainless Steel	Open Arm, Flanged Base	75 lb

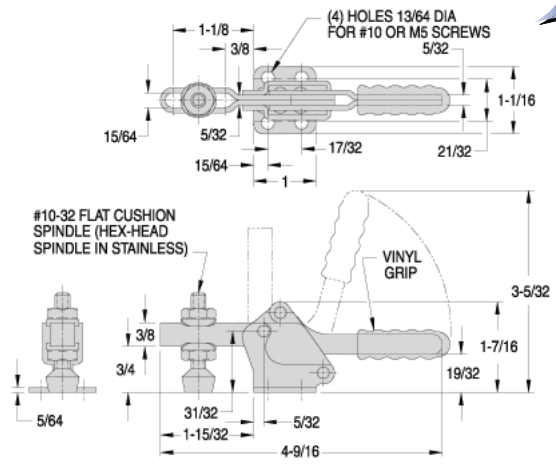
FEATURES: Smallest hold-down toggle clamp available. Choose either a solid arm for fixed spindle location or an open arm for adjustable location. Arm opens 90° while handle moves 80°.



Horizontal - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80005	Steel	Open Arm, Flanged Base	150 lb
80006	Stainless Steel	Open Arm, Flanged Base	150 lb

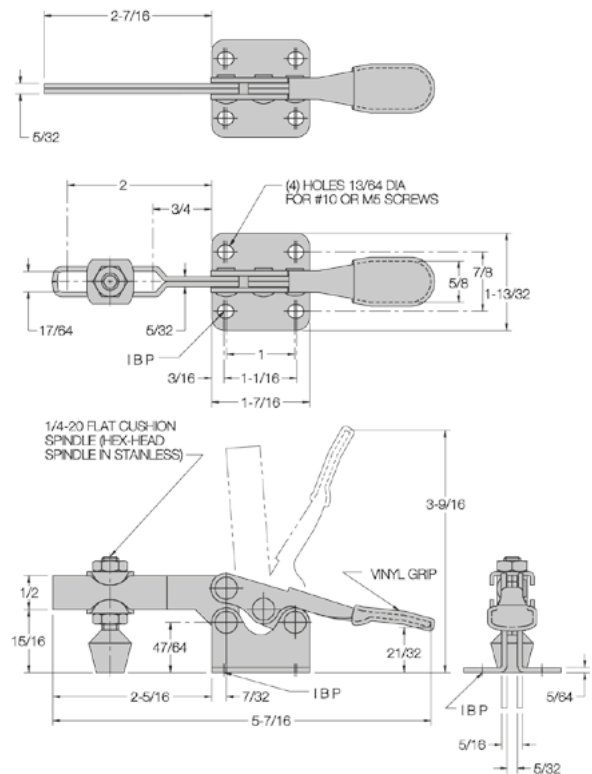
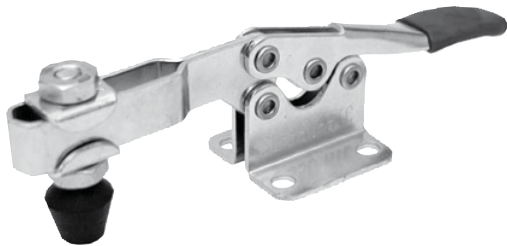
FEATURES: An extremely powerful clamp for its small size. Open arm provides adjustable spindle location. Arm opens 90° while handle moves 75°.



NEW! Horizontal - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80007	Steel	Open Arm, Flanged Base	200 lb
80008	Stainless Steel	Solid Arm, Straight Base	250 lb

FEATURES: Popular medium-duty clamp. Choose either a solid arm for fixed spindle location or an open arm for adjustable location. Arm opens 90° while handle moves 80°.

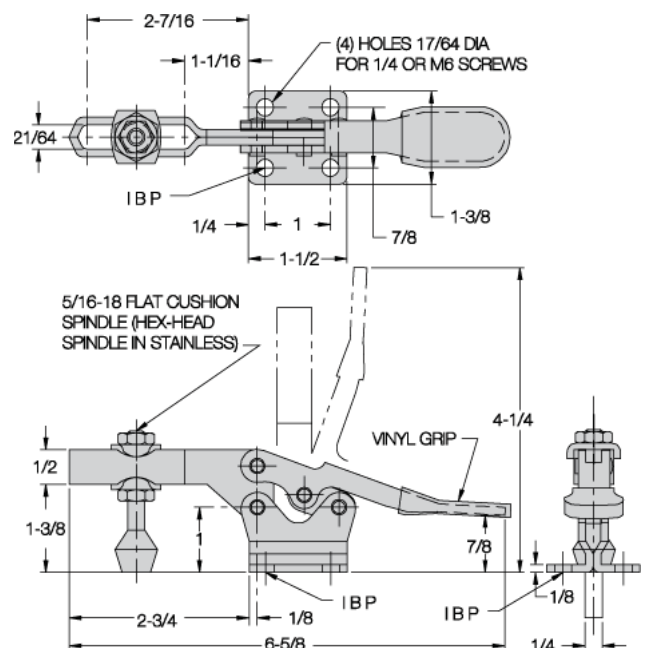
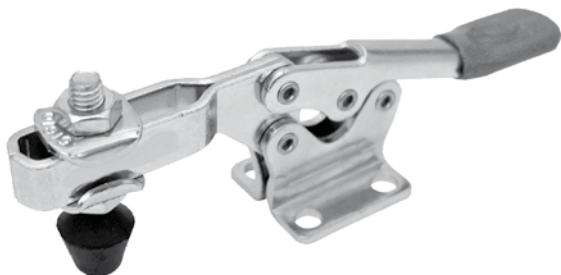


NEW!

Horizontal - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80009	Steel	Open Arm, Flanged Base	500 lb
80010	Stainless Steel	Open Arm, Flanged Base	600 lb

FEATURES: Strong-yet-compact horizontal-handle clamp. Open arm provides adjustable spindle location. Arm opens 90° while handle moves 65°.



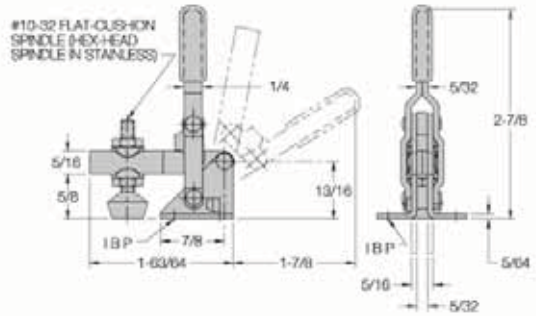
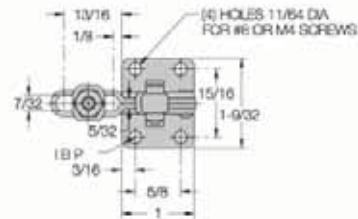
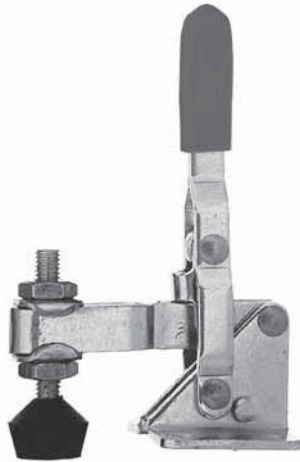
Toggle Clamps



Vertical - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80011	Steel	Open Arm, Flanged Base	100 lb
80012	Stainless Steel	Open Arm, Flanged Base	125 lb

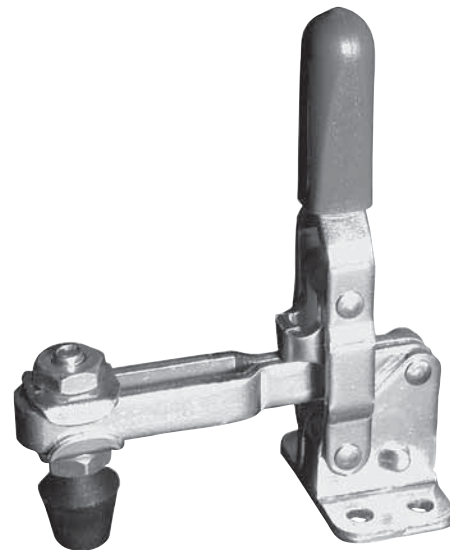
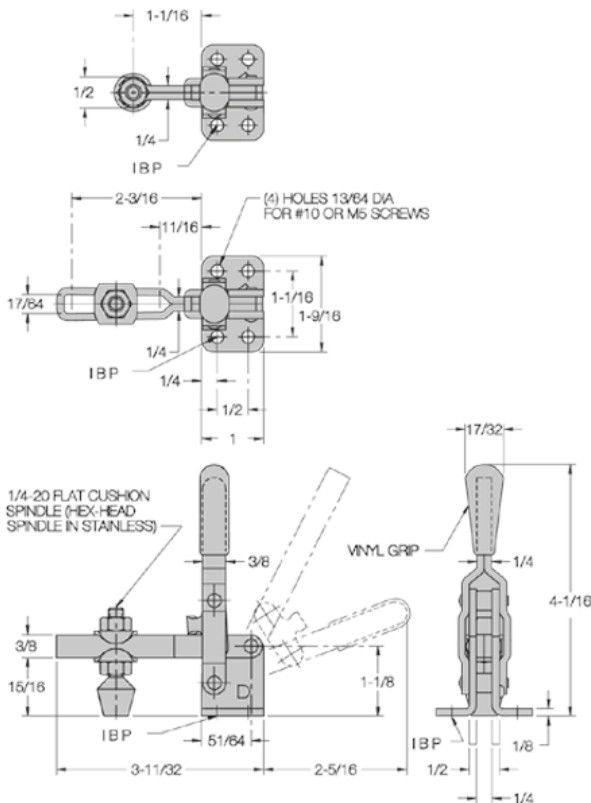
FEATURES: Smallest wide-opening hold-down toggle clamp available. Open arm provides adjustable spindle location. Arm opens 100° while handle moves 56°.



Vertical - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80013	Steel	Solid Arm, Flanged Base	100 lb
80014	Steel	Long Open Arm, Flanged Base	125 lb
80015	Stainless Steel	Solid Arm, Flanged Base	200 lb
80016	Stainless Steel	Long Open Arm, Flanged Base	200 lb

FEATURES: Small-yet-powerful clamp available in several configurations. Choose either a solid arm for fixed spindle location or an open arm for adjustable location. Arm opens 117° while handle moves 69°.

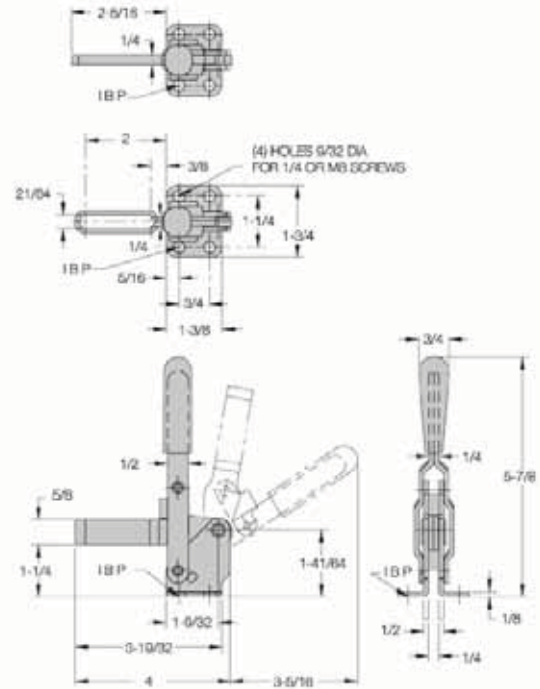
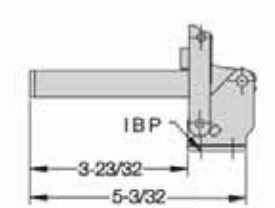
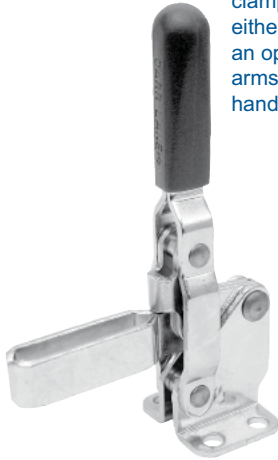


NEW!

Vertical - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80017	Steel	Open Arm, Flanged Base	500 lb
80018	Steel	Long Open Arm, Flanged Base	500 lb
80019	Stainless Steel	Open Arm, Flanged Base	500 lb

FEATURES: Our most popular wide-opening clamp, available in many configurations. Choose either a solid arm for fixed spindle location or an open arm for adjustable location. Extra-long arms are also available. Arm opens 100° while handle moves 69°.

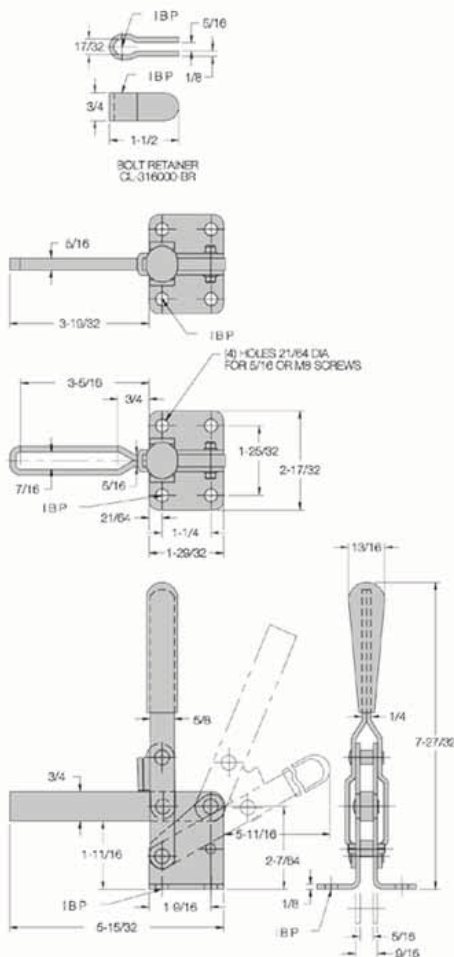


NEW!

Vertical - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80020	Steel	Open Arm, Flanged Base	750 lb
80021	Stainless Steel	Open Arm, Flanged Base	750 lb

FEATURES: Large wide-opening clamp, available in several configurations. Choose either a solid arm for fixed spindle location or an open arm for adjustable location. Arm opens 106° while handle moves 58°.



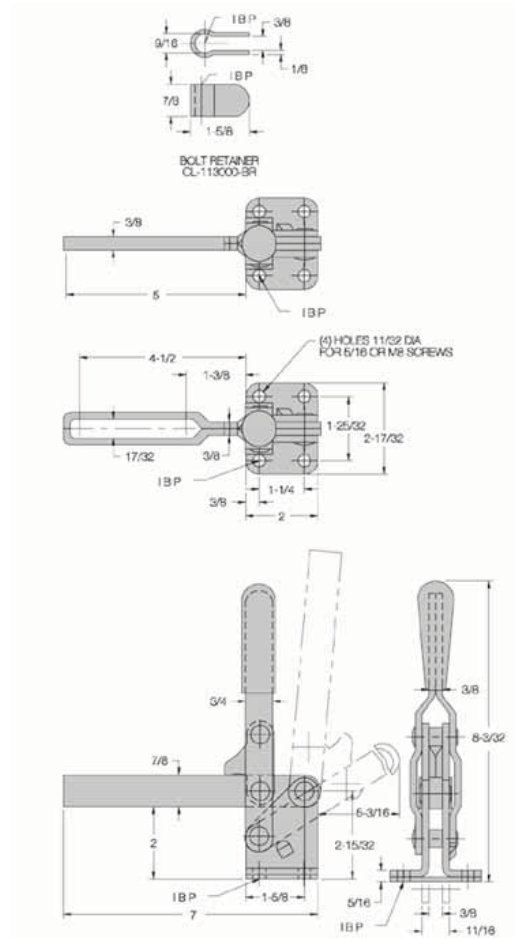
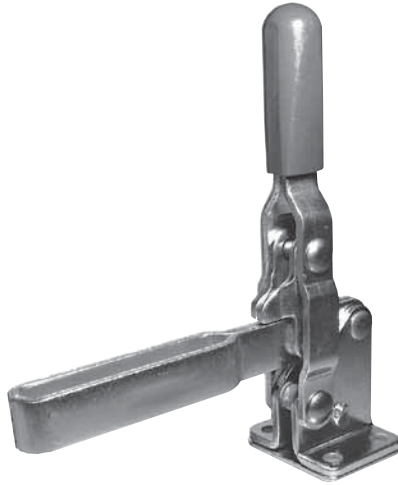
Toggle Clamps

NEW!

Vertical - Handle Toggle Clamps

Part Number	Type	Description	Holding Capacity
80022	Steel	Open Arm, Flanged Base	1000 lb

FEATURES: Large, heavy-duty wide-opening clamp, available in several configurations. Choose either a solid arm for fixed spindle location or an open arm for adjustable location. Arm opens 120° while handle moves 67°.

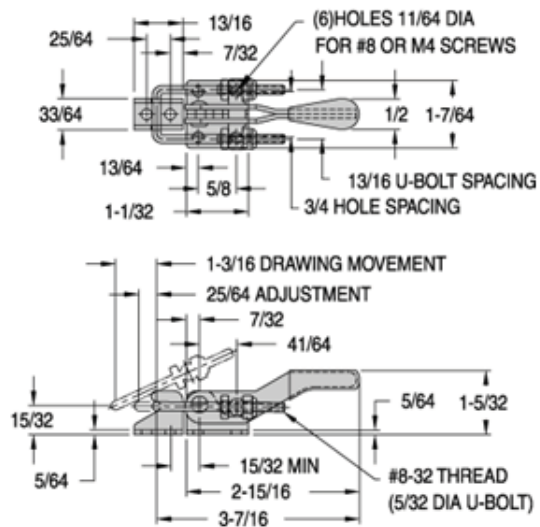
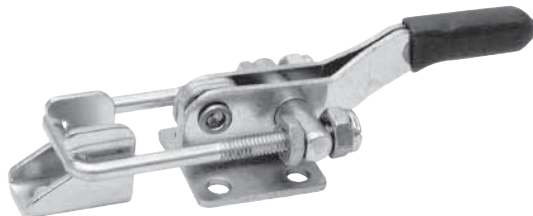


NEW!

Latch-Action Toggle Clamps

Part Number	Type	Description	Holding Capacity
80023	Steel	Flanged Base	360 lb
80024	Stainless Steel	Flanged Base	360 lb

FEATURES: Miniature latch clamp with high holding capacity. Threaded U bolt for adjustability. Large, comfortable handle grip. 1-3/16" drawing movement. Threaded U bolt allows a 25/64" adjustment range. Supplied with matching latch plate.

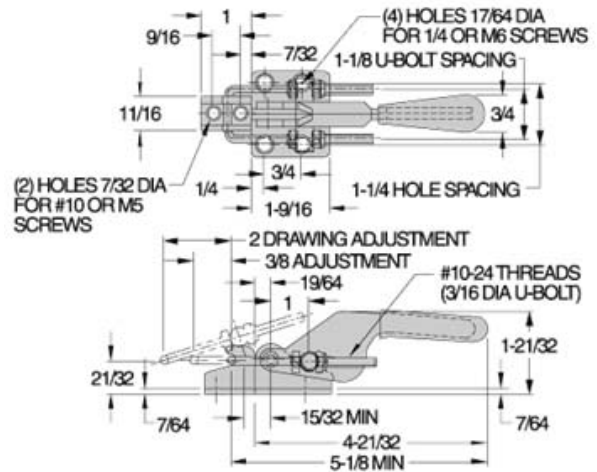


NEW!

Latch-Action Toggle Clamps

Part Number	Type	Description	Holding Capacity
80025	Steel	Flanged Base	700 lb
80026	Stainless Steel	Flanged Base	700 lb

FEATURES: Versatile latch clamp with a threaded U bolt for adjustability. Large, comfortable handle grip. 2" drawing movement. Threaded U bolt allows a 3/8" adjustment range. Supplied with matching latch plate.

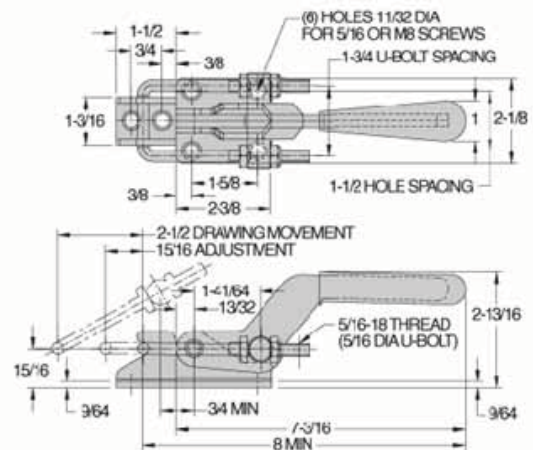
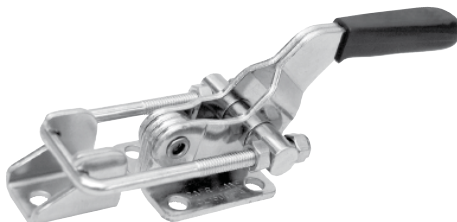


NEW!

Latch-Action Toggle Clamps

Part Number	Type	Description	Holding Capacity
80027	Steel	Flanged Base	2000 lb
80028	Stainless Steel	Flanged Base	2000 lb

FEATURES: Versatile latch clamp with a threaded U bolt for adjustability. Large, comfortable handle grip. 2" drawing movement. Threaded U bolt allows a 3/8" adjustment range. Supplied with matching latch plate.

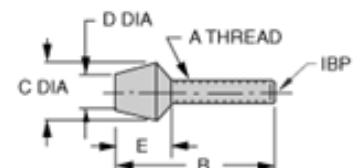


NEW!

Flat Cushion Spindles

Part Number	A	B	C	D	E
80029	10-32 x 1-3/8	1-3/8	9/16	7/16	7/16
80030	1/4-20 x 1-5/8	1-5/8	5/8	13/32	5/8
80031	1/4-20 x 2-1/8	2-1/8	5/8	13/32	5/8
80032	5/16-18 x 2-1/4	2-1/4	3/4	1/2	3/4
80033	5/16-18 x 3	3	3/4	1/2	3/4
80034	3/8-16 x 2-1/2	2-1/2	13/16	5/8	7/8
80035	3/8-16 x 3-1/2	3-1/2	13-16	5/8	7/8

FEATURES: This is the standard spindle supplied with most clamps. Molded neoprene tip provides medium clamping force with some compensation for part-size variation. Also provides scratch free clamping. Fully threaded for maximum adjustment range. Assembly includes two jam nuts.



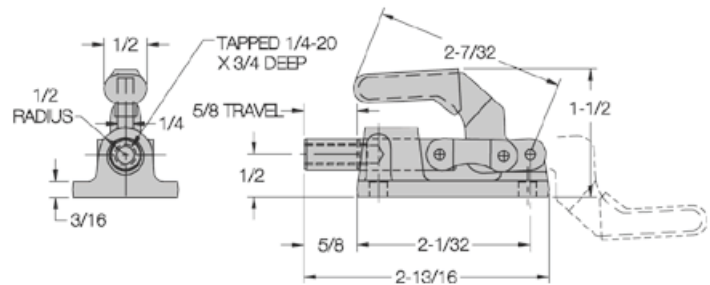
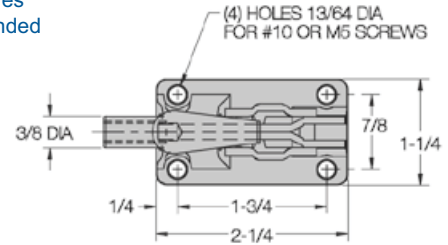
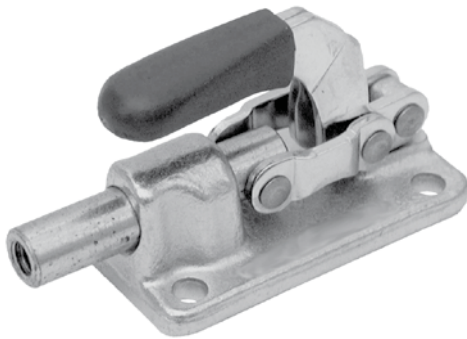
Toggle Clamps



Push / Pull Toggle Clamps

Part Number	Type	Description	Tapped Hole in Plunger	Holding Capacity
80036	Steel	Tapped Plunger, Flanged Base	1/4-20	300 lb
80037	Stainless Steel	Tapped Plunger, Flanged Base	1/4-20	300 lb

FEATURES: Tiny yet extremely powerful plunger clamp with a forged steel base. Requires very little mounting space due to its narrow base and compact low profile. Locks in extended or retracted position. 5/8" plunger travel.



Push / Pull Toggle Clamps

Part Number	Type	Description	Tapped Hole in Plunger	Holding Capacity
80038	Steel	Tapped Plunger, Flanged Base	5/16-18	300 lb

FEATURES: Medium-size clamp that locks in extended or retracted position. 1-1/4" plunger travel.



American Made Products for Work Holding and Fastener Applications



Northwestern Tools, Inc.

Product Guide for Tooling and Manufacturing



Hoist Rings

Hoist Rings



Material: Forged alloy steel with minimum tensile strength of 180,000 psi. Certified Heat Treatment.

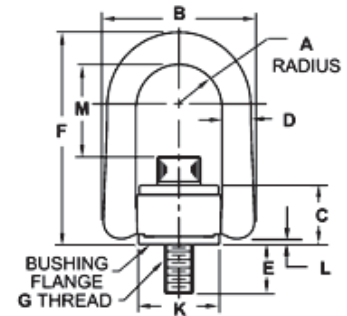
Design Factor: Minimum 5:1 Safety Factor, 100% Magnetic Particle Inspected. Hoist Rings retain the same rated load from 0 to 90 degrees from the bolt axis.

Range of Movement: 360° Swivel, 180° Pivot

Specifications: Meets Military Specification No. MIL-STD 209, Meets ASME B30.26

Finish: Black Oxide Finish for corrosion resistance

Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.



PATENT NO. 5,405,210

All dimensions approximate variations do not effect use or design factor.



Heavy Duty® Hoist Rings

Complete Line Through 30,000 Pounds Load Range

Part Number	Rated Load - lbs	A	B	C	D	+/- 0.06 E	F	G	K	L	M	*TL ft-lbs	Weight lbs
ADB33112	550	.65	2.29	.96	.44	.56	3.23	1/4-20	1.25	.15	1.57	5	.50
ADB33212	800	.65	2.29	.96	.44	.56	3.23	5/16-18	1.25	.15	1.51	7	.52
ADB33214	800	.65	2.29	.96	.44	1.06	3.23	5/16-18	1.25	.15	1.51	7	.54
ADB33312	1000	.65	2.29	.96	.44	.56	3.23	3/8-16	1.25	.15	1.45	12	.56
ADB33314	1000	.65	2.29	.96	.44	1.06	3.23	3/8-16	1.25	.15	1.45	12	.58
ADB33316	2250	.65	2.29	.96	.44	1.06	3.23	1/2-13	1.25	.15	1.45	25	.60
ADB33512	2500	1	3.5	1.5	.75	.75	5.31	1/2-13	1.89	.17	2.56	28	1.71
*ADB33513	2500	1	3.5	1.5	.75	.75	6.87	1/2-13	1.89	.17	4.12	28	2.04
ADB33515	2500	1	3.5	1.5	.75	1	5.31	1/2-13	1.89	.17	2.56	28	1.72
*ADB33505	2500	1	3.5	1.5	.75	1	6.87	1/2-13	1.89	.17	4.12	28	2.05
ADB33516	2500	1	3.5	1.5	.75	1.25	5.31	1/2-13	1.89	.17	2.56	28	1.82
*ADB33517	2500	1	3.5	1.5	.75	1.25	6.87	1/2-13	1.89	.17	4.12	28	2.15
ADB33612	4000	1	3.5	1.5	.75	.75	5.31	5/8-11	1.89	.17	2.44	60	1.76
*ADB33613	4000	1	3.5	1.5	.75	.75	6.87	5/8-11	1.89	.17	4	60	2.09
ADB33614	4000	1	3.5	1.5	.75	1	5.31	5/8-11	1.89	.17	2.44	60	1.78
*ADB33604	4000	1	3.5	1.5	.75	1	6.87	5/8-11	1.89	.17	4	60	2.11
ADB33615	4000	1	3.5	1.5	.75	1.25	5.31	5/8-11	1.89	.17	2.44	60	1.88
*ADB33616	4000	1	3.5	1.5	.75	1.25	6.87	5/8-11	1.89	.17	4	60	2.21
ADB33714	5000	1	3.5	1.5	.75	1	5.31	3/4-10	1.89	.17	2.31	100	1.89
*ADB33715	5000	1	3.5	1.5	.75	1	6.87	3/4-10	1.89	.17	3.87	100	2.22
ADB33716	5000	1	3.5	1.5	.75	1.5	5.31	3/4-10	1.89	.17	2.31	100	2.02
*ADB33717	5000	1	3.5	1.5	.75	1.5	6.87	3/4-10	1.89	.17	3.87	100	2.35
ADB33108	7000	1.4	5.1	2.05	1	.95	7.37	3/4-10	2.81	.18	3.57	100	7.2
*ADB33168	7000	1.4	5.1	2.05	1	.95	9	3/4-10	2.81	.19	5.2	100	7.93
ADB33102	7000	1.4	5.1	2.05	1	1.20	7.37	3/4-10	2.81	.20	3.57	100	7.23
*ADB33162	7000	1.4	5.1	2.05	1	1.20	9	3/4-10	2.81	.21	5.2	100	7.96
ADB33103	7000	1.4	5.1	2.05	1	1.45	7.37	3/4-10	2.81	.22	3.57	100	7.25
*ADB33163	7000	1.4	5.1	2.05	1	1.45	9	3/4-10	2.81	.23	5.2	100	7.98
ADB33104	8000	1.4	5.1	2.05	1	.95	7.37	7/8-9	2.81	.24	3.32	160	7.33
*ADB33164	8000	1.4	5.1	2.05	1	.95	9	7/8-9	2.81	.25	4.95	160	8.06
ADB33101	8000	1.4	5.1	2.05	1	1.2	7.37	7/8-9	2.81	.26	3.32	160	7.33
*ADB33161	8000	1.4	5.1	2.05	1	1.2	9	7/8-9	2.81	.27	4.82	160	8.06
ADB33105	10000	1.4	5.1	2.05	1	1.45	7.37	1 - 8	2.81	.28	3.2	230	7.57
*ADB33165	10000	1.4	5.1	2.05	1	1.45	9	1 - 8	2.81	.29	4.82	230	8.3
ADB33106	10000	1.4	5.1	2.05	1	1.2	7.37	1 - 8	2.81	.30	3.2	230	7.63
*ADB33166	10000	1.4	5.1	2.05	1	1.2	9	1 - 8	2.81	.31	4.82	230	8.36
ADB33107	10000	1.4	5.1	2.05	1	2.45	7.37	1 - 8	2.81	.32	3.2	230	7.81
*ADB33167	10000	1.4	5.1	2.05	1	2.2	9	1 - 8	2.81	.33	4.2	230	8.54
ADB33402	15000	2	6.75	2.87	1.25	2.12	9.22	1-1/4 - 7	3.75	.34	3.74	470	15.74
ADB33401	15000	2	6.75	2.87	1.25	2.63	9.22	1-1/4 - 7	3.75	.35	3.74	470	16
†ADB33420	20000	2	6.75	2.87	1.25	2.63	9.22	1-3/8 - 6	3.75	.32	3.62	670	17.2
ADB33424	24000	2	6.75	2.87	1.25	2.63	9.22	1-1/2 - 6	3.75	.32	3.49	800	18.1
†ADB33427	30000	2	6.75	2.87	1.25	2.96	9.22	2-4 - 1/2	3.75	.32	3.49	1100	22.9
†ADB33432	30000	2	6.75	2.87	1.25	2.96	9.22	2 - 8	3.75	.32	3.49	1100	22.9

• Long Bar Model

* Recommended Torque Load
† Supplied with stud and nut

For load ranges of 50,000 to 100,000 lbs refer to our Safety Engineered Hoist Rings.
Heavy Duty® Hoist Rings are completely interchangeable with Safety Engineered Hoist Rings.

3130 Valleywood Drive | Dayton, Ohio 45429 | Phone: 937.298.9994 | Fax: 937.298.3715

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800.236.3956

Material: Forged alloy steel with minimum tensile strength of 180,000 psi. Certified Heat Treatment.

Design Factor: Minimum 5:1 Safety Factor, 100% Magnetic Particle Inspected. Hoist Rings retain the same rated load from 0 to 90 degrees from the bolt axis.

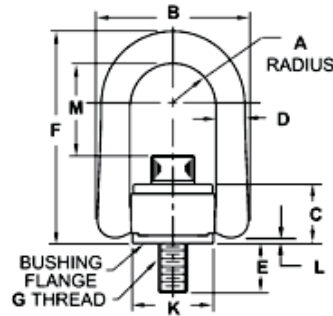
Range of Movement: 360° Swivel, 180° Pivot

Specifications: Meets Military Specification No. MIL-STD 209, Meets ASME B30.26

Finish: Black Oxide Finish for corrosion resistance

Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.

All dimensions approximate variations do not effect use or design factor.



PATENT NO. 5,405,210

Useful Conversion Data (Approximation)			
	To Convert From	To	Multiply By
Length	Millimeter (mm)	Inch (in)	0.03937
Force	Newton (N)	Pound-Force (lbf)	0.22481
Stress	Newton/mm ²	Pound/Inch ² (psi)	145.04
Torque	Newton-Meter (Nm)	Foot-Pound (ft-lbs)	0.7376
Weight	Kilogram (kg)	Pound (lb)	2.204



Metric Heavy Duty® Hoist Rings

Part Number	Rated Load - kg	A	B	C	D	+/- 1.52 E	F	G	K	L	M	*TL Nm	Weight kg
ADB34212	400	16.5	58.2	24.4	11.1	16	82	M8x1.25	31.8	4	38.5	9.5	.24
ADB34214	400	16.5	58.2	24.4	11.1	21	82	M8x1.25	31.8	4	38.5	9.5	.25
ADB34312	450	16.5	58.2	24.4	11.1	16	82	M10x1.5	31.8	4	36.5	16	.25
ADB34314	450	16.5	58.2	24.4	11.1	26	82	M10x1.5	31.8	4	36.5	16	.26
ADB34515	1050	25.4	88.9	38.1	19.1	25	134.9	M12x1.75	48	4.4	65	37	.78
•ADB34505	1050	25.4	88.9	38.1	19.1	25	174.6	M12x1.75	48	4.4	104.7	37	.93
ADB34516	1050	25.4	88.9	38.1	19.1	32	134.9	M12x1.75	48	4.4	65	37	.83
•ADB34517	1050	25.4	88.9	38.1	19.1	32	174.6	M12x1.75	48	4.4	101.7	37	.98
ADB34614	1900	25.4	88.9	38.1	19.1	25	134.9	M16x2.0	48	4.4	62	80	.81
•ADB34604	1900	25.4	88.9	38.1	19.1	25	174.6	M16x2.0	48	4.4	101.7	80	.96
ADB34615	1900	25.4	88.9	38.1	19.1	32	134.9	M16x2.0	48	4.4	62	80	.85
•ADB34616	1900	25.4	88.9	38.1	19.1	32	174.6	M16x2.0	48	4.4	101.7	80	1
ADB34714	2200	25.4	88.9	38.1	19.1	25	134.6	M20x2.5	48	4.4	58.7	135	.86
•ADB34715	2200	25.4	88.9	38.1	19.1	25	174.6	M20x2.5	48	4.4	98.4	135	1.01
ADB34716	2200	25.4	88.9	38.1	19.1	38	134.6	M20x2.5	48	4.4	58.7	135	.92
•ADB34717	2200	25.4	88.9	38.1	19.1	38	174.6	M20x2.5	48	4.4	98.4	135	1.07
ADB34101	3000	35.6	129.5	52.1	25.4	28	187.2	M20x2.5	71.4	4.6	89.7	135	3.14
•ADB34161	3000	35.6	129.5	52.1	25.4	28	228.6	M20x2.5	71.4	4.6	131.1	135	3.47
ADB34102	4200	35.6	129.5	52.1	25.4	28	187.2	M24x3.0	71.4	4.6	85.7	311	3.29
•ADB34162	4200	35.6	129.5	52.1	25.4	28	228.6	M24x3.0	71.4	4.6	127.1	311	3.62
ADB34103	4200	35.6	129.5	52.1	25.4	38	187.2	M24x3.0	71.4	4.6	85.7	311	3.3
•ADB34163	4200	35.6	129.5	52.1	25.4	38	228.6	M24x3.0	71.4	4.6	127.1	311	3.63
ADB34105	4500	35.6	129.5	52.1	25.4	38	187.2	M30x3.5	71.4	4.6	79.7	311	3.44
•ADB34165	4500	35.6	129.5	52.1	25.4	38	228.6	M30x3.5	71.4	4.6	79.7	311	3.55
ADB34107	4500	35.6	129.5	52.1	25.4	48	187.2	M30x3.5	71.4	4.6	79.7	311	3.55
•ADB34167	4500	35.6	129.5	52.1	25.4	48	228.6	M30x3.5	71.4	4.6	121.1	311	3.88
ADB34401	7000	50.8	171.5	72.9	31.8	67	234.2	M30x3.5	95.2	8.2	95	637.2	7.26
ADB34402	11000	50.8	171.5	72.9	31.8	67	234.2	M36x4.0	95.2	8.2	88.6	1085.5	8.21
ADB34403	12500	50.8	171.5	72.9	31.8	80	234.2	M42x4.5	95.2	8.2	88.6	1085.5	10.14
ADB34404	13500	50.8	171.5	72.9	31.8	80	234.2	M48x5.0	95.2	8.2	88.6	1491.4	10.59

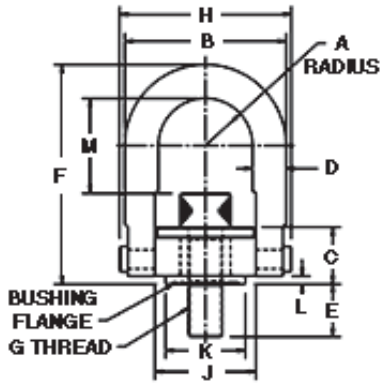
• Long Bar Model

* Recommended Torque Load

Replacement screws are available.

All Dimensions in Millimeters

Hoist Rings



Material: Alloy steel with minimum tensile strength of 180,000 psi.
Certified Heat Treatment.

Design Factor: Minimum 5:1 Safety Factor, 100% Magnetic Particle Inspected, Hoist Rings retain the same rated load from 0 to 90 degrees from the bolt axis, Standard tolerance +/- .030 inch unless otherwise specified.

Specifications: Meets ASME B30.26

Range Of Movement: 360° Swivel, 180° Pivot

Finish: Black Oxide Finish for corrosion resistance

Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.

PATENT NO. 5,848,815

All dimensions approximate – variations do not effect use or design factor.



Safety Engineered Hoist Rings

Part Number	Rated Load - lbs	A	B	C	D	+/- 0.06 E	+/- 0.06 F	+/- 0.06 G	+/- 0.06 H	J	K	L	M	*TL ft-lbs	Weight lbs
ADB23050	550	.43	1.61	.71	3/8	.54	2.67	1/4-20	1.84	1.00	.75	.17	1.33	5	0.31
ADB23051	800	.43	1.61	.71	3/8	.29	2.67	5/16-18	1.84	1.00	.75	.17	1.27	7	0.31
ADB23052	800	.43	1.61	.71	3/8	.54	2.67	5/16-18	1.84	1.00	.75	.17	1.27	7	0.31
ADB23053	1000	.43	1.61	.71	3/8	.54	2.67	3/8-16	1.84	1.00	.75	.17	1.21	12	0.31
ADB23301	2500	.7	2.4	.93	1/2	1.07	3.77	1/2-13	2.58	1.49	1.25	.20	1.84	28	0.31
ADB23004	2500	.88	3.25	1.22	3/4	.78	4.78	1/2-13	3.52	1.99	1.50	.16	2.31	28	1
*ADB23322	2500	.88	3.25	1.22	3/4	.73	6.72	1/2-13	3.52	1.99	1.50	.16	4.25	28	2.31
ADB23005	2500	.88	3.25	1.22	3/4	1.03	4.78	1/2-13	3.52	1.99	1.50	.16	2.31	28	2.75
*ADB23323	2500	.88	3.25	1.22	3/4	1.03	6.72	1/2-13	3.52	1.99	1.50	.16	4.25	28	2
ADB23006	2500	.88	3.25	1.22	3/4	1.28	4.78	1/2-13	3.52	1.99	1.50	.16	2.31	28	2.31
*ADB23324	2500	.88	3.25	1.22	3/4	1.28	6.72	1/2-13	3.52	1.99	1.50	.16	4.25	28	2.75
ADB23001	4000	.88	3.25	1.22	3/4	.78	4.78	5/8-11	3.52	1.99	1.50	.16	2.18	60	2.44
*ADB23319	4000	.88	3.25	1.22	3/4	.78	6.72	5/8-11	3.52	1.99	1.50	.16	4.12	60	2.75
ADB23002	4000	.88	3.25	1.22	3/4	1.03	4.78	5/8-11	3.52	1.99	1.50	.16	2.18	60	2.44
*ADB23320	4000	.88	3.25	1.22	3/4	1.03	6.72	5/8-11	3.52	1.99	1.50	.16	4.12	60	2.88
ADB23003	4000	.88	3.25	1.22	3/4	1.28	4.78	5/8-11	3.52	1.99	1.50	.16	2.18	60	2.56
*ADB23321	4000	.88	3.25	1.22	3/4	1.28	6.72	5/8-11	3.52	1.99	1.50	.16	4.12	60	3
ADB23007	5000	.88	3.25	1.22	3/4	1.03	4.78	3/4-10	3.52	1.99	1.50	.16	2.06	100	2.56
*ADB23325	5000	.88	3.25	1.22	3/4	1.03	6.72	3/4-10	3.52	1.99	1.50	.16	4.00	100	3
ADB23009	5000	.88	3.25	1.22	3/4	1.53	4.78	3/4-10	3.52	1.99	1.50	.16	2.06	100	6.63
*ADB23327	5000	.88	3.25	1.22	3/4	1.53	6.72	3/4-10	3.52	1.99	1.50	.16	4.00	100	7.25
ADB23102	7000	1.4	4.8	1.71	1	1.04	6.52	3/4-10	5.14	3.00	2.37	.24	3.06	100	6.63
*ADB23329	7000	1.4	4.8	1.71	1	1.04	8.11	3/4-10	5.14	3.00	2.37	.24	4.65	100	6.63
ADB23103	7000	1.4	4.8	1.71	1	1.54	6.52	3/4-10	5.14	3.00	2.37	.24	3.06	100	6.75
*ADB23330	7000	1.4	4.8	1.71	1	1.54	8.11	3/4-10	5.14	3.00	2.37	.24	4.65	100	6.75
ADB23101	8000	1.4	4.8	1.71	1	1.04	6.52	7/8-9	5.14	3.00	2.37	.24	2.93	160	7
*ADB23328	8000	1.4	4.8	1.71	1	1.04	8.11	7/8-9	5.14	3.00	2.37	.24	4.52	160	7
ADB23105	10000	1.4	4.8	1.71	1	1.29	6.52	1-8	5.14	3.00	2.37	.24	2.81	230	7
*ADB23331	10000	1.4	4.8	1.71	1	1.29	8.11	1-8	5.14	3.00	2.37	.24	4.40	230	7
ADB23106	10000	1.4	4.8	1.71	1	1.54	6.52	1-8	5.14	3.00	2.37	.24	2.81	230	7
*ADB23332	10000	1.4	4.8	1.71	1	1.54	8.11	1-8	5.14	3.00	2.37	.24	4.40	230	7
ADB23107	10000	1.4	4.8	1.71	1	2.29	6.52	1-8	5.14	3.00	2.37	.24	2.81	230	7
*ADB23333	10000	1.4	4.8	1.71	1	2.29	8.11	1-8	5.14	3.00	2.37	.24	4.40	230	7
ADB23401	15000	1.75	6	2.11	1-1/4	1.89	8.73	1-1/4-7	6.5	3.76	3.20	.35	4.12	470	14
ADB23202	24000	2.25	8	2.81	1-3/4	2.7	12.47	1-1/2-6	8.55	4.87	4.20	.47	6.41	800	33.75
ADB23200	30000	2.25	8	2.81	1-3/4	2.96	12.47	2-4 1/2	8.55	4.87	4.20	.47	5.41	800	36
**ADB23201	30000	2.25	8	2.81	1-3/4	2.96	12.47	2-4 1/2	8.55	4.87	4.20	.47	5.41	800	36
ADB23501	50000	3	1.5	4.09	2-1/4	4	16.87	2-1/2-8	11.67	6.52	5.75	1.12	8.03	2100	87.5
ADB23503	50000	3	1.5	4.09	2-1/4	4	16.87	2-1/2-4	11.67	6.52	5.75	1.12	8.03	2100	87.5
ADB23600	75000	3.75	13	5.27	2-3/4	5.2	19.5	3-4	14.15	8.10	7.25	1.00	8.48	4300	166
ADB23701	100000	4	14.5	6.06	3-1/4	7	22.09	3-1/2-4	15.9	8.60	7.25	1.09	9.28	6600	240
ADB23751	150000	5	18	7.5	4	8.5	27.38	4-14-4	19.69	10.75	9.87	1.33	12.13	12000	525
ADB23760	200000	6	22	9	5	9	33	5-4	24	13.00	12.38	1.88	14.50	19800	760
ADB23770	250000	6	22	9	5	9	33	6-4	24	13.00	12.38	1.88	14.00	29000	841

• Long Bar Model

*Recommend Torque Load

**Supplied with socket head cap screw

150,000, 200,000 and 250,000 lbs sizes available.

Material: Alloy steel with minimum tensile strength of 180,000 psi.
Certified Heat Treatment.

Design Factor: Minimum 5:1 Safety Factor, 100% Magnetic Particle Inspected,
 Hoist Rings retain the same rated load from 0 to 90 degrees from the bolt axis,
 Standard tolerance +/- .030 inch unless otherwise specified.

Specifications: Meets ASME B30.26

Range Of Movement: 360° Swivel, 180° Pivot

Finish: Black Oxide Finish for corrosion resistance

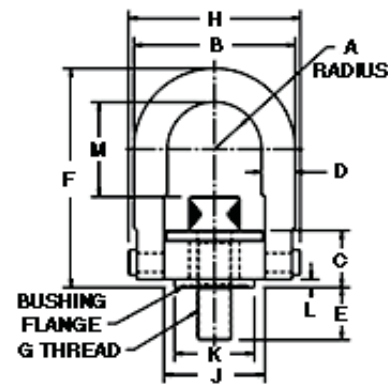
**Also available in a wide range of plating - Cadmium,
 Titanium-Cadmium, Nickel, etc.**

PATENT NO. 5,848,815

All dimensions approximate – variations do not effect use or design factor.



Useful Conversion Data (Approximation)			
	To Convert From	To	Multiply By
Length	Millimeter (mm)	Inch (in)	0.03937
Force	Newton (N)	Pound-Force (lbf)	0.22481
Stress	Newton/mm ²	Pound/Inch ² (psi)	145.04
Torque	Newton-Meter (Nm)	Foot-Pound (ft-lbs)	0.7376
Weight	Kilogram (kg)	Pound (lb)	2.204



Metric Safety Engineered Hoist Rings

Part Number	Rated Load - kg	A	B	C	D	+/- 1.52 E	F	G	H	J	K	L	M	*TL Nm	Weight kg
ADB24008	400	10.9	40.9	18	9.5	17	67.8	M8x1.25	46.7	25.4	19.1	4.3	32.1	9.5	0.14
ADB24010	450	10.9	40.9	18	9.5	17	67.8	M10x1.5	46.7	25.4	19.1	4.3	30.2	16	0.14
ADB24012	1050	22.4	82.5	31	19	19	121.4	M12x1.75	89.4	50.5	38	4.1	59.4	37	1.05
*ADB24014	1050	22.4	82.5	31	19	19	170.6	M12x1.75	89.4	50.5	38	4.1	108.6	37	1.27
ADB24016	1900	22.4	82.5	31	19	24	121.4	M16x2.0	89.4	50.5	38	4.1	55.4	80	1.11
*ADB24018	1900	22.4	82.5	31	19	24	170.6	M16x2.0	89.4	50.5	38	4.1	104.6	80	1.33
ADB24020	2200	22.4	82.5	31	19	30	121.4	M20x2.5	89.4	50.5	38	4.1	51.4	135	1.16
*ADB24021	2200	22.4	82.5	31	19	30	170.6	M20x2.5	89.4	50.5	38	4.1	100.6	135	1.38
ADB24022	3000	35.6	121.2	43.4	25.4	29	165.8	M20x2.5	130.5	76.2	58.7	6.1	77	135	3.06
*ADB24023	3000	35.6	121.2	43.4	25.4	29	206.7	M20x2.5	130.5	76.2	58.7	6.1	117.9	135	3.77
ADB24024	4200	35.6	121.2	43.4	25.4	34	165.8	M24x3.0	130.5	76.2	58.7	6.1	73	311	3.18
*ADB24026	4200	35.6	121.2	43.4	25.4	34	206.7	M24x3.0	130.5	76.2	58.7	6.1	113.9	311	3.89
ADB24030	4500	35.6	121.2	43.4	25.4	54	165.8	M30x3.5	130.5	76.2	58.7	6.1	67	311	3.3
*ADB24032	4500	35.6	121.2	43.4	25.4	54	206.7	M30x3.5	130.5	76.2	58.7	6.1	109.9	311	4.01
ADB24040	7000	44.5	152.4	53.6	31.8	46	221.7	M30x3.5	165.1	95.5	81.3	8.9	106.3	637.2	6.36
ADB24042	7000	44.5	152.4	53.6	31.8	66	221.7	M30x3.5	165.1	95.5	81.3	8.9	106.3	637.2	6.7
ADB24050	11000	57.2	203.2	71.4	44.5	69	316.7	M36x4.0	217.2	123.7	106.7	11.9	164.8	1085.5	15.34
†ADB24052	12500	57.2	203.2	71.4	44.5	79	316.7	M42x4.5	217.2	123.7	106.7	11.9	158.8	1085.5	15.91
†ADB24054	13500	57.2	203.2	71.4	44.5	79	316.7	M48x5.0	217.2	123.7	106.7	11.9	152.8	1491.4	16.36
†ADB24060	22000	76.2	266.7	104	57.2	102	428.5	M64x6.0	296.4	165.6	146.1	28.4	203.3	2847.5	39.77
†ADB24062	31500	95.25	330.2	133.9	69.85	132	495.3	M72x6.0	368.3	205.74	184.15	25.4	215.39	5670	75.45
†ADB24064	51000	101.6	368.3	153.9	82.55	178	561.09	M90x6.0	403.86	218.44	196.85	27.69	235.71	9560	109.09

• Long Bar Model

*Recommend Torque Load
 † Supplied with stud and nut.

All Dimensions in Millimeters

Hoist Rings

Material: 300 Series Stainless Steel

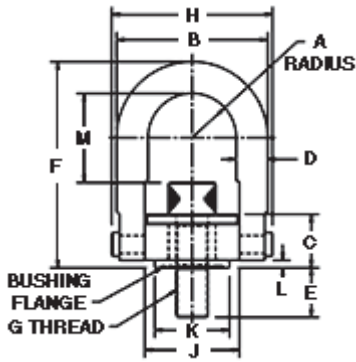
Design Factor: Minimum 5:1 Safety Factor, Hoist Rings retain the same rated load from 0 to 90 degrees from the bolt axis, Standard tolerance +/- .030 inch unless otherwise specified.

Range Of Movement: 360° Swivel, 180° Pivot

Specifications: NDT: 100% Liquid Penetrant Tested Per MIL-STD-5002, ASTM 1417, Purification Process: Cleaned and Passivated Per ASTM A967, QQ-P-35 TYPE II

Typical Applications: Use Stainless for Corrosive, Cryogenic or Elevated Temperature Environments

All dimensions approximate – variations do not effect use or design factor.



NEW!

Stainless Steel Safety Engineered Hoist Rings

Part Number	Rated Load - lbs	A	B	C	D	+/- 0.60 E	+/- 0.06 F	G	+/- 0.06 H	J	K	L	M	*TL ft-lbs	Weight
ADB29050	275	.43	1.61	.71	3/8	.54	2.67	1/4-20	1.84	1	.75	.17	1.33	2.5	5 oz
ADB29051	400	.43	1.61	.71	3/8	.29	2.67	5/16-18	1.84	1	.75	.17	1.27	3.5	5 oz
ADB29052	400	.43	1.61	.71	3/8	.54	2.67	5/16-18	1.84	1	.75	.17	1.27	3.5	5 oz
ADB29053	500	.43	1.61	.71	3/8	.54	2.67	3/8-16	1.84	1	.75	.17	1.21	6	5 oz
ADB29301	1250	.70	2.4	.93	1/2	1.07	3.77	1/2-13	2.58	1.49	1.25	.20	1.84	14	1 lb
ADB29004	1250	.88	3.25	1.22	3/4	.78	4.78	1/2-13	3.52	1.99	1.5	.16	2.31	14	2 lb. 5 oz
•ADB29322	1250	.88	3.25	1.22	3/4	.73	6.72	1/2-13	3.52	1.99	1.5	.16	4.25	14	2 lb. 12 oz
ADB29005	1250	.88	3.25	1.22	3/4	1.03	4.78	1/2-13	3.52	1.99	1.5	.16	2.31	14	2 lb. 5 oz
•ADB29323	1250	.88	3.25	1.22	3/4	1.03	6.72	1/2-13	3.52	1.99	1.5	.16	4.25	14	2 lb
ADB29006	1250	.88	3.25	1.22	3/4	1.28	4.78	1/2-13	3.52	1.99	1.5	.16	2.31	14	2 lb. 5 oz
•ADB29324	1250	.88	3.25	1.22	3/4	1.28	6.72	1/2-13	3.52	1.99	1.5	.16	4.25	14	2 lb. 12 oz
ADB29001	2000	.88	3.25	1.22	3/4	.78	4.78	5/8-11	3.52	1.99	1.5	.16	2.18	30	2 lb. 7 oz
ADB29002	2000	.88	3.25	1.22	3/4	1.03	4.78	5/8-11	3.52	1.99	1.5	.16	2.18	30	2 lb. 7 oz
•ADB29320	2000	.88	3.25	1.22	3/4	1.03	6.72	5/8-11	3.52	1.99	1.5	.16	4.12	30	2 lb. 14 oz
ADB29003	2000	.88	3.25	1.22	3/4	1.28	4.78	5/8-11	3.52	1.99	1.5	.16	2.18	30	2 lb. 7 oz
•ADB29321	2000	.88	3.25	1.22	3/4	1.28	6.72	5/8-11	3.52	1.99	1.5	.16	4.12	30	2 lb 14 oz
ADB29007	2500	.88	3.25	1.22	3/4	1.03	4.78	3/4-10	3.52	1.99	1.5	.16	2.06	50	2 lb 9 oz
•ADB29325	2500	.88	3.25	1.22	3/4	1.03	6.72	3/4-10	3.52	1.99	1.5	.16	4	50	3 lb
ADB29009	2500	.88	3.25	1.22	3/4	1.53	4.78	3/4-10	3.52	1.99	1.5	.16	2.06	50	2 lb. 9 oz
•ADB29327	2500	.88	3.25	1.22	3/4	1.53	6.72	3/4-10	3.52	1.99	1.5	.16	4	50	3 lb
ADB29102	3500	1.4	4.8	1.71	1	1.04	6.52	3/4-10	5.14	3	2.37	.24	3.06	50	6 lb. 10 oz
•ADB29329	3500	1.4	4.8	1.71	1	1.04	8.11	3/4-10	5.14	3	2.37	.24	4.65	50	7 lb. 4 oz
ADB29103	3500	1.4	4.8	1.71	1	1.54	6.52	3/4-10	5.14	3	2.37	.24	3.06	50	6 lb. 10 oz
•ADB29330	3500	1.4	4.8	1.71	1	1.54	8.11	3/4-10	5.14	3	2.37	.24	4.65	50	6 lb. 10 oz
ADB29101	4000	1.4	4.8	1.71	1	1.04	6.52	7/8-9	5.14	3	2.37	.24	2.93	80	6 lb. 12 oz
•ADB29328	4000	1.4	4.8	1.71	1	1.04	8.11	7/8-9	5.14	3	2.37	.24	4.52	80	6 lb. 12 oz
ADB29105	5000	1.4	4.8	1.71	1	1.29	6.52	1-8	5.14	3	2.37	.24	2.81	115	7 lb
ADB•29331	5000	1.4	4.8	1.71	1	1.29	8.11	1-8	5.14	3	2.37	.24	4.4	115	7 lb
ADB29106	5000	1.4	4.8	1.71	1	1.54	6.52	1-8	5.14	3	2.37	.24	2.81	115	7 lb
•ADB29332	5000	1.4	4.8	1.71	1	1.54	8.11	1-8	5.14	3	2.37	.24	4.4	115	7 lb
ADB29107	5000	1.4	4.8	1.71	1	2.29	6.52	1-8	5.14	3	2.37	.24	2.81	115	7 lb
•ADB29333	5000	1.4	4.8	1.71	1	2.29	8.11	1-8	5.14	3	2.37	.24	4.4	115	7 lb
ADB29401	7500	1.75	6	2.11	1-1/4	1.89	8.73	1-1/4-7	6.5	3.76	3.2	.35	4.12	235	14 lb
ADB29202	12000	2.25	8	2.81	1-3/4	2.7	12.47	1-1/2-6	8.55	4.87	4.2	.47	6.41	400	33 lb. 12 oz
ADB29200	15000	2.25	8	2.81	1-3/4	2.96	12.47	2-4 1/2	8.55	4.87	4.2	.47	5.41	400	36 lb
ADB29501	25000	3	10.5	4.09	2-1/4	4	16.87	2-1/2-8	11.67	6.52	5.75	1.12	8.03	1050	87 lb. 8 oz
ADB29503	25000	3	10.5	4.09	2-1/4	4	16.87	2-1/2-4	11.67	6.52	5.75	1.12	8.03	1050	87 lb. 8 oz
ADB29600	37500	3.75	13	5.27	2-3/4	5.2	19.5	3-4	14.15	8.1	7.25	1	8.48	2150	166 lb
ADB29701	50000	4	14.5	6.06	3-1/4	7	22.09	3-1/2-4	15.9	8.6	7.75	1.09	9.28	3300	240 lb

• Long Bar Model

*Recommend Torque Load

Material: 300 Series Stainless Steel

Design Factor: Minimum 5:1 Safety Factor, Hoist Rings retain the same rated load from 0 to 90 degrees from the bolt axis.

Range Of Movement: 360° Swivel, 180° Pivot

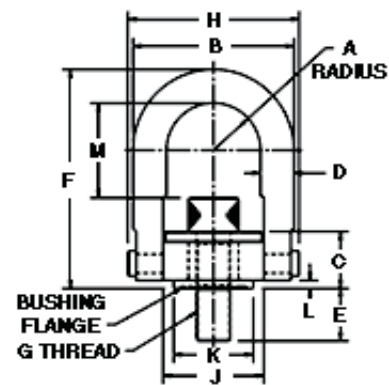
Specifications: NDT: 100% Liquid Penetrant Tested Per MIL-STD-5002, ASTM E 1417, Purification Process: Cleaned and Passivated Per ASTM A967, QQ-P-35 TYPE II

Typical Applications: Use Stainless for Corrosive, Cryogenic or Elevated Temperature Environments

All dimensions approximate – variations do not effect use or design factor.



Useful Conversion Data (Approximation)			
	To Convert From	To	Multiply By
Length	Millimeter (mm)	Inch (in)	0.03937
Force	Newton (N)	Pound-Force (lbf)	0.22481
Stress	Newton/mm ²	Pound/Inch ² (psi)	145.04
Torque	Newton-Meter (Nm)	Foot-Pound (ft-lbs)	0.7376
Weight	Kilogram (kg)	Pound (lb)	2.204



Metric Stainless Steel Safety Engineered Hoist Rings

Part Number	Rated Load - kg	A	B	C	D	+/- 1.52 E	F	G	H	J	K	L	M	*TL Nm	Weight kg
ADB29808	200	10.9	40.9	18	9.5	17	67.8	M8 x 1.25	46.7	25.4	19.1	4.3	32.1	4.75	0.14
ADB29810	225	10.9	40.9	18	9.5	17	67.8	M10 x 1.5	46.7	25.4	19.1	4.3	30.2	8	0.14
ADB29812	525	22.4	82.5	31	19	19	121.4	M12 x 1.75	89.4	50.5	38	4.1	59.4	18.5	1.05
*ADB29814	525	22.4	82.5	31	19	19	170.6	M12 x 1.75	89.4	50.5	38	4.1	108.6	18.5	1.27
ADB29816	950	22.4	82.5	31	19	24	121.4	M16 x 2.0	89.4	50.5	38	4.1	55.4	40	1.11
*ADB29818	950	22.4	82.5	31	19	24	170.6	M16 x 2.0	89.4	50.5	38	4.1	104.4	40	1.33
ADB29820	1100	22.4	82.5	31	19	30	121.4	M20 x 2.5	89.4	50.5	38	4.1	51.4	67.5	1.16
*ADB29821	1100	22.4	82.5	31	19	30	170.6	M20 x 2.5	89.4	50.5	38	4.1	100.4	67.5	1.38
ADB29822	1500	35.6	121.2	43.4	25.4	29	165.8	M20 x 2.5	130.5	76.2	58.7	6.1	77	67.5	3.06
*ADB29823	1500	35.6	121.2	43.4	25.4	29	206.7	M20 x 2.5	130.5	76.2	58.7	6.1	117.9	67.5	3.77
ADB29824	2100	35.6	121.2	43.4	25.4	34	165.8	M24 x 3.0	130.5	76.2	58.7	6.1	73	155.5	3.18
*ADB29826	2100	35.6	121.2	43.4	25.4	34	206.7	M24 x 3.0	130.5	76.2	58.7	6.1	113.9	155.5	3.89
ADB29830	2250	35.6	121.2	43.4	25.4	54	165.8	M30 x 3.5	130.5	76.2	58.7	6.1	67	155.5	3.3
*ADB29832	2250	35.6	121.2	43.4	25.4	54	206.7	M30 x 3.5	130.5	76.2	58.7	6.1	109.9	155.5	4.01
ADB29840	3500	44.5	152.4	53.6	31.8	46	221.7	M30 x 3.5	165.1	95.5	81.3	8.9	106.3	318.6	6.36
ADB29842	3500	44.5	152.4	53.6	31.8	66	221.7	M30 x 3.5	165.1	95.5	81.3	8.9	106.3	318.6	6.7
ADB29850	5500	57.2	203.2	71.4	44.5	69	316.7	M36 x 4.0	217.2	123.7	106.7	11.9	164.8	542.7	15.34
ADB29852	6250	57.2	203.2	71.4	44.5	79	316.7	M42 x 4.5	217.2	123.7	106.7	11.9	158.8	542.7	15.91
ADB29854	7250	57.2	203.2	71.4	44.5	79	316.7	M48 x 5.0	217.2	123.7	106.7	11.9	152.8	542.7	16.36
ADB29860	11000	76.2	266.7	104	57.2	102	428.5	M64 x 6.0	296.4	165.6	146.1	28.4	203.3	711.8	39.77

• Long Bar Model

*Recommend Torque Load

All Dimensions in Millimeters

Hoist Rings

Material: Alloy steel with minimum tensile strength of 180,000 psi.
Certified Heat Treatment

Design Factor: Minimum 5:1 Safety Factor, 100% Magnetic Particle Inspected. Hoist Rings retain the same rated load from 0 to 90 degrees from the bolt axis.

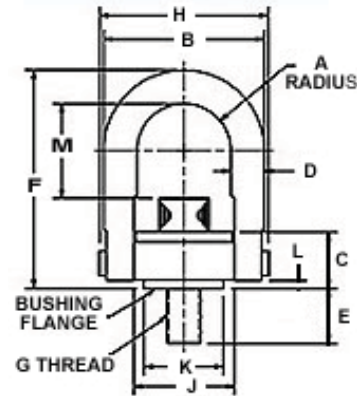
Range of Movement: 360° Swivel, 180° Pivot

Finish: Black Oxide Finish for corrosion resistance

Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.

Typical Applications: The new EZ-Torque® Hoist Ring eliminates the need of locating and installing hydraulic torque multipliers for large hoist ring installations. A 75,000 lb. rated load hoist ring requires the mounting screw to be torqued to 4,300 ft.lbs. Using EZ-Torque® Hoist Ring requires only a standard torque wrench and 92 ft.lbs. of torque per bolt!

All dimensions approximate – variations do not effect use or design factor.



EZ-Torque® Hoist Rings

STANDARD

Part Number	Rated Load - lbs	A	B	C	D	+/- 0.12 E	+/- 0.12 F	G	+/- 0.12 H	J	K	L	M	*TL ft-lbs	EZ-Torque® ft-lbs	Weight lbs
ADB23490	15,000	1.75	6.0	2.11	1 1/4	1.89	8.73	1-1/4-7	6.50	3.76	3.20	0.35	3.88	470	10	16.00
ADB23494	24,000	2.25	8.0	2.81	1 3/4	2.70	12.47	1-1/2-6	8.55	4.87	4.20	0.47	6.12	800	18	37.75
ADB23290	30,000	2.25	8.0	2.81	1 3/4	2.96	12.47	2-4-1/2	8.55	4.87	4.20	0.47	6.12	1100	23	39.00
ADB23590	50,000	3.00	10.5	4.09	2 1/4	4.00	16.87	2-1/2-8	11.67	6.52	5.75	1.12	7.73	2100	49	92.00
ADB23592	50,000	3.00	10.5	4.09	2 1/4	4.00	16.87	2-1/2-4	11.67	6.52	5.75	1.12	7.73	2100	49	92.00
ADB23690	75,000	3.75	13.0	5.27	2 3/4	5.20	19.50	3-4	14.15	8.10	7.25	1.00	8.53	4300	92	174.60
ADB23790	100,000	4.00	14.5	6.06	3 1/4	7.00	22.09	3-1/2-4	15.90	8.60	7.75	1.09	9.28	6600	98	246.94
ADB23792	150,000	5.00	18.0	7.50	4	8.50	27.38	4 1/4-4	19.69	10.75	9.87	1.33	12.93	12000	123	527.00
ADB23794	200,000	6.00	22.0	9.00	5	9.00	33.00	5-4	24.00	13.00	12.38	1.88	15.00	19800	193	763.00
ADB23798	250,000	6.00	22.0	9.00	5	9.00	33.00	6-4	24.00	13.00	12.38	1.88	15.00	29000	207	841.00



METRIC

Part Number	Rated Load - kg	A	B	C	D	+/- 3 E	+/- 3 F	G	+/- 3 H	J	K	L	M	*TL Nm	EZ-Torque® Nm	Weight kg
ADB24490	7,000	44.5	152.4	53.6	31.8	66	221.7	M30 x 3.5	165.1	95.5	81.3	8.9	106.3	637.2	13.5	7.26
ADB24494	11,000	57.2	203.2	71.4	44.5	69	316.7	M36 x 4.0	217.2	123.7	106.7	11.9	164.8	1085.5	20.8	17.13
ADB24498	12,500	57.2	203.2	71.4	44.5	79	316.7	M42 x 4.5	217.2	123.7	106.7	11.9	158.8	1085.5	21.6	17.13
ADB24290	13,500	57.2	203.2	71.4	44.5	79	316.7	M48 x 5.0	217.2	123.7	106.7	11.9	152.8	1491.4	21.3	17.69
ADB24592	22,000	76.2	266.7	104.0	57.2	102	428.5	M64 x 6.0	296.4	165.6	146.1	28.4	203.3	2847.5	53.9	41.73
ADB24690	31,500	95.2	330.2	133.9	69.8	132	495.3	M72 x 6.0	368.3	205.7	184.1	25.4	215.4	5670.0	124.7	79.20
ADB24790	51,000	101.6	368.3	153.9	82.5	178	561.1	M90 x 6.0	403.9	218.4	196.8	27.7	235.7	9560.0	132.8	112.01

All Dimensions in Millimeters

*Standard Torque Load.



Material: Forged Chrome Moly Steel. Certified Heat Treatment.

Design Factor: Minimum 6:1 Safety Factor, 100% Magnetic Partic Inspected. High strength screws are 100% Magnetic Particle Inspected.

Range of Movement: 180° Pivot

Specifications: Rings and bodies are Magnetic Particle Inspected per ASTM 1444.

Finish: Black Oxide Finish for corrosion resistance

Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.

All dimensions approximate – variations do not effect use or design factor.

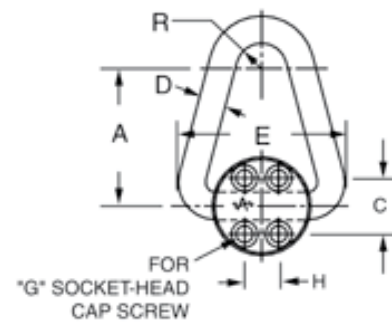
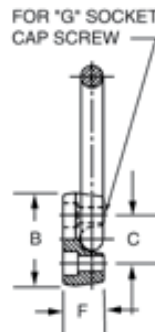
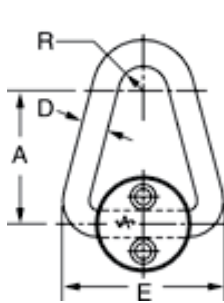
NEW!

Flip-Flop Hoist Rings

†Part Number	Part No. with Screws	Rated Load* lbs	A	B	C	D	+/- 0.06 E	F	G	H	R	Installation Torque ft-lbs	†Weight lbs	Weight with Screws lbs
ADB34030	ADB34030S	2,000	2	1-3/4	1	5/16	2-1/2	3/4	5/16 (2 PLCS)	0	1/2	4-7	.54	.58
ADB34035	ADB34035S	2,500	2-1/2	2-1/4	1-1/8	3/8	3-3/16	7/8	3/8 (2 PLCS)	0	5/8	7-10	1.02	1.07
ADB34040	ADB34040S	5,000	3	2-5/8	1-1/2	1/2	3-7/8	1-1/8	1/2 (2 PLCS)	0	3/4	20-25	1.92	2.06
ADB34045	ADB34045S	12,000	4	3-1/8	1-5/8	3/4	5-1/4	1-3/8	1/2 (4 PLCS)	1-1/4	7/8	20-25	3.94	4.10
ADB34050	ADB34050S	20,000	5	3-5/8	2-1/16	1	6-3/16	1-7/8	5/8 (4 PLCS)	1-1/4	1	42-50	7.44	7.94

*Use High Strength Screws to obtain maximum load capacity.

† Mounting Screws Not Included



NEW!

High Strength Screws

Part No.	Used P/N	Screw Thread	Screw Thread	Weight lbs
ADB23812	ADB34030	5/16-18	1-1/4	.04
ADB23813	ADB34035	3/8-16	1-1/4	.05
ADB23804	ADB34040	1/2-13	2	.14
ADB23805	ADB34045	1/2-13	2-1/4	.16
ADB33645	ADB34050	5/8-11	2-3/4	.50

Hoist Rings



PATENT NO. 6,267,422

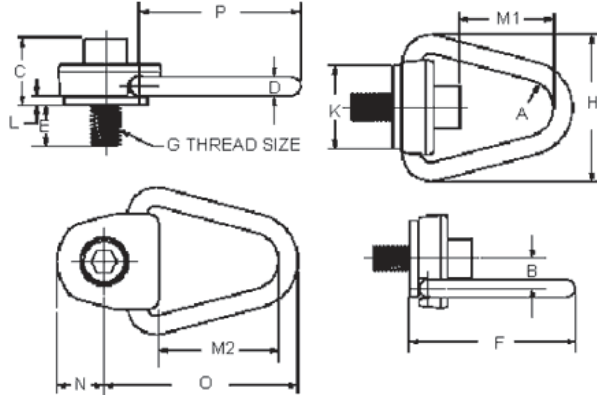
Range of Movement: 360° Swivel

Design Factor: Minimum 5:1 Safety Factor in any direction, 100% Magnetic Particle Inspected. Unit is supplied in one (1) piece so that parts cannot get lost. Self-aligning in the direction of the load.

Finish: Black Oxide Finish for corrosion resistance

Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.

All dimensions approximate – variations do not effect use or design factor.



NEW!

Heavy Duty® Side Pull Hoist Rings

STANDARD

Part Number	Rated Load lbs	G	A	B	C	D	+/- 0.06 E	F	H	K	L	M1	M2	N	O	P	*TL ft/lbs	Weight lbs
ADB36305	800	5/16-18	3/4	7/8	1 21/64	1/2	.479	4 23/32	3 7/8	2 3/16	7/32	2 57/64	3 3/16	1 1/4	5 1/8	4 1/4	7	2.05
ADB36310	1000	3/8-16	3/4	7/8	1 25/64	1/2	.479	4 23/32	3 7/8	2 3/16	7/32	2 27/32	3 3/16	1 1/4	5 1/8	4 1/4	12	2.12
ADB36315	2500	1/2-13	3/4	7/8	1 17/32	1/2	.979	4 23/32	3 7/8	2 3/16	7/32	2 45/64	3 3/16	1 1/4	5 1/8	4 1/4	28	2.12
ADB36320	4000	5/8-11	3/4	7/8	1 41/64	1/2	.979	4 23/32	3 7/8	2 3/16	7/32	2 59/64	3 3/16	1 1/4	5 1/8	4 1/4	60	2.22
ADB36325	5000	3/4-10	3/4	7/8	1 25/32	1/2	1.229	4 23/32	3 7/8	2 3/16	7/32	2 15/16	3 3/16	1 1/4	5 1/8	4 1/4	100	2.34
ADB36330	7000	3/4-10	7/8	1 1/4	2 1/4	3/4	1 1/4	6 1/4	5 1/4	3 1/8	5/16	4	4 3/16	1 5/8	6 3/4	5 5/8	100	6.01
ADB36335	8000	7/8-9	7/8	1 1/4	2 3/8	3/4	1 1/4	6 1/4	5 1/4	3 1/8	5/16	3 7/8	4 3/16	1 5/8	6 3/4	5 5/8	160	6.13
ADB36340	10000	1-8	7/8	1 1/4	2 1/2	3/4	1 1/2	6 1/4	5 1/4	3 1/8	5/16	3 3/4	4 3/16	1 5/8	6 3/4	5 5/8	230	6.20

NEW!

METRIC

Part Number	Rated Load kg	G	A	B	C	D	+/- 1.52 E	F	H	K	L	M1	M2	N	O	P	*TL Nm	Weight kg
ADB36805	400	M8 x 1.25	19	22	34	13	14	120	99	56	5	73	81	32	130	108	9.5	.93
ADB36810	450	M10 x 1.5	19	22	36	13	24	120	99	56	5	71	81	32	130	108	16.0	.96
ADB36815	1050	M12 x 1.75	19	22	38	13	37	120	99	56	5	69	81	32	130	108	37.0	.96
ADB36820	1900	M16 x 2.0	19	22	42	13	37	120	99	56	5	65	81	32	130	108	80.0	1.01
ADB36825	2200	M20 x 2.5	19	22	46	13	37	120	99	56	5	61	81	32	130	108	135.0	1.07
ADB36830	3000	M20 x 2.5	22	32	57	19	39	159	133	79	8	83	106	41	171	143	135.0	2.73
ADB36835	4200	M24 x 3.0	22	32	61	19	43	159	133	79	8	79	106	41	171	143	311.0	2.78

All Dimensions in Millimeters

*Recommended Torque Load

Material: Alloy Steel (Certified Heat Treat)

Design Factor: Minimum 5:1 Safety Factor, 100% Magnetic Particle Inspected.

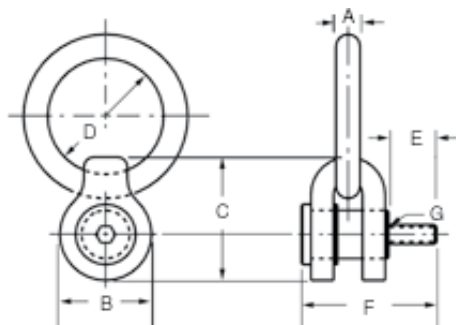
Range of Movement: 360° Swivel

Specifications: Meets Military Specification No. MIL-STD 209J, Meets ASME B30.26

Finish: Black Oxide Finish for corrosion resistance

Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.

All dimensions approximate – variations do not effect use or design factor.



NEW! Side Pull Hoist Rings

STANDARD										
Part Number	Load Capacity lbs	A	B	C	D	+/- 0.06 E	F	G	*TL ft/lbs	Weight lbs
ADB36110	650	3/8	1 1/2	2	2	5/8	2 5/16	5/16-18	3.5	0.25
ADB36115	800	3/8	1 1/2	2	2	3/4	2 5/8	3/8-16	4.5	0.25
ADB36120	1800	5/8	2 3/8	3 3/16	3	1	3 1/2	1/2-13	15	3.25
ADB36125	2500	5/8	2 3/8	3 3/16	3	1 1/4	3 7/8	5/8-11	25	3.25
ADB36130	4100	1	3 3/4	5	4	1 1/4	5 3/4	3/4-10	50	11.25
ADB36135	7100	1	3 3/4	5	4	1 3/4	6	1-8	90	11.5
ADB36140	14000	1 3/8	4 5/8	6 13/16	6	2	6 7/8	1 1/4-7	150	27.75
ADB36143	14000	1 3/8	4 5/8	6 13/16	6	2	6 7/8	1 1/4-8	150	27.75
ADB36145	17200	1 3/8	4 5/8	6 13/16	6	2 1/2	7 7/8	1 1/2-6	250	31.5
ADB36148	17200	1 3/8	4 5/8	6 13/16	6	2 1/2	7 7/8	1 1/2-8	250	31.5
ADB36150	29000	1 1/2	4 5/8	6 13/16	5 1/4 x 10 1/2	3 1/8	8 9/16	2-4 1/2	300	42
ADB36155	29000	1 1/2	4 5/8	6 13/16	5 1/4 x 10 1/2	3 1/8	8 9/16	2-8	300	42

NEW! METRIC

METRIC										
Part Number	Load Capacity kg	A	B	C	D	+/- 1.52 E	F	G	*TL Nm	Weight kg
ADB36710	400	9.5	38.1	50.8	50.8	16	54.1	M8 x 1.25	8	0.1
ADB36715	650	9.5	38.1	50.8	50.8	20	58.1	M10 x 1.5	16	0.1
ADB36720	900	15.9	60.3	81	76.2	24	84.33	M12 x 1.75	27	1.5
ADB36725	1600	15.9	60.3	81	76.2	31	96.3	M16 x 2.0	64	1.5
ADB36730	2500	25.4	95.3	127	101.6	40	128.9	M20 x 2.5	125	5.2
ADB36735	3500	25.4	95.3	127	101.6	48	136.9	M24 x 3.0	210	5.2
ADB36740	5500	34.9	117.5	173	152.4	60	166.2	M30 x 3.5	413	12.6
ADB36745	8000	34.9	117.5	173	152.4	72	178.2	M36 x 4.0	720	14.5
ADB36748	11000	34.9	117.5	173	152.4	84	190.2	M42 x 4.5	1156	14.5
ADB36750	14000	38.1	117.5	173	133.4 x 266.7	96	202.2	M48 x 5.0	1681	19.2
ADB36755	25000	38.1	117.5	173	133.4 x 266.7	128	234.2	M64 x 6.0	4001	19.2

All Dimensions in Millimeters

*Recommended Torque Load

Hoist Rings

Design Factor: Minimum 5:1 Safety Factor, 100% Magnetic Particle inspected.

Range of Movement: 360° Swivel, 180° Pivot

Finish: Black Oxide Finish for corrosion resistance

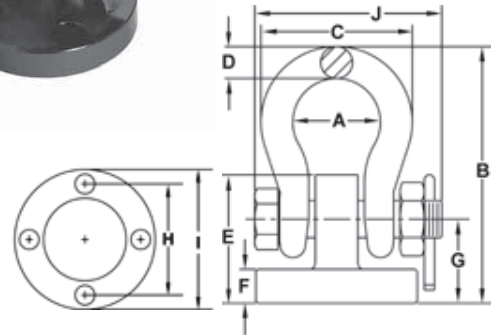
Also available in a wide range of plating - Cadmium, Titanium-Cadmium, Nickel, etc.

Typical Applications: The Shackle Hoist Ring is used for OEM applications and permanent mounting on dies, molds, fixtures or equipment. Can be bolted or welded in place and are ideal for lifting large and heavy structures.

Destructive testing by outside independent laboratories

Meets OSHA standards

All dimensions approximate – variations do not effect use or design factor.



PATENT NO. 5,823,588



Shackle Hoist Rings

Part Number	Working Load lbs	Screw Size	A	B	C	D	+/- 0.06 E	F	G	H	I	J	Weight lbs
ADB36510	2000	1/4-20x1/2	1.03	2.96	1.78	0.38	1.43	0.4	0.91	1.56	2.1	2.17	0.8
ADB36520	3000	5/16-18x1/2	1.16	3.55	2.03	0.44	1.76	0.52	1.16	1.76	2.4	2.51	1.3
ADB36530	4000	3/8-16x5/8	1.31	3.91	2.31	0.5	1.91	0.52	1.21	2.1	2.9	2.8	2.04
ADB36540	6500	7/16-14x3/4	1.69	4.97	2.94	0.69	2.41	0.64	1.51	2.56	3.5	3.53	3.8
ADB36550	13000	5/8-11x1	2.28	6.85	4.03	0.97	3.31	0.9	2.06	3.4	4.6	4.71	9.55
ADB36560	19000	3/4-10x1-1/4	2.91	8.75	5.16	1.25	4.01	1.14	2.61	4	5.4	5.09	18.1
ADB36570	24000	7/8-9x2	3.25	9.68	5.75	1.38	4.51	1.3	2.91	4.5	6.1	6.51	25.7



Universal Lift Rings

Part Number	Screw Sizes	Capacity (bs)	A	B	C	D	+/- .060 E	F	Weight lbs	
ADB34005	S1	1/4-20	400	3-1/16	1/2	2-1/8	7/16	1-1/4	1-3/8	0.8
	S2	5/16-18	800	3-1/16	1/2	2-1/8	7/16	1-1/4	1-3/8	0.8
	S3	3/8-16	1400	3-1/16	1/2	2-1/8	7/16	1-1/4	1-3/8	0.8
ADB34010	S1	1/2-13	2600	4-3/8	3/4	3	5/8	1-3/4	2	2.5
	S2	5/8-11	4000	4-3/8	3/4	3	5/8	1-3/4	2	2.5
	S3	3/4-10	6000	4-3/8	3/4	3	5/8	1-3/4	2	2.5

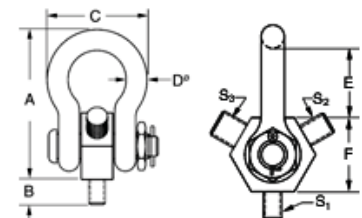


Minimum 5:1 Safety Factor, 100% Magnetic Particle inspected.

The Universal Lift Rings provide six commonly used thread sizes: 1/4-20, 5/16-18, 3/8-16, 1/2-13, 5/8-11 and 3/4-10.

Caution: Do not apply side load. For straight lift only. Listed capacities are maximum safe working load.

All dimensions approximate – variations do not effect use or design factor.




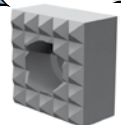
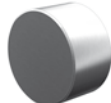


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NEW PRODUCTS

NEW!  Hex Drive Short Spring Plungers Page 8-9	NEW!  Hex Drive Short w/ Ex. Travel Spring Plungers Page 10	NEW!  Press Fit w/ Ex. Travel Spring Plungers Page 13	NEW!  Press-Thru™ w/ Ex. Travel Spring Plungers Page 13	NEW!  Hex Drive Ball Plungers Page 21-22
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NEW SIZES!  Hand Retractable Short Plungers Pull Ring Page 32-33	NEW SIZES!  Hand Retractable Plungers Long Reach Page 34	NEW!  Mounting Bases Page 35 & 60	NEW SIZES!  T-Slot Nut Page 44	NEW!  Mini Clamps Page 51-52
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NEW!  Tooling Blocks Page 86	NEW!  Grippers Page 88-91	NEW!  Swivots Page 92	NEW!  Toggle Clamps Page 94-100	NEW!  Hoist Rings Page 102- 112
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Hoist Rings

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