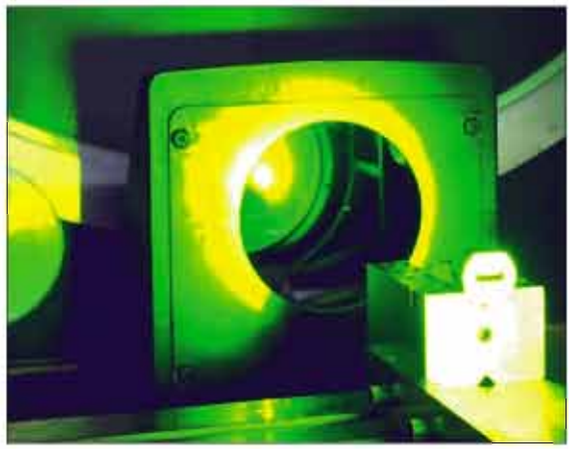
Selective Basic Ball Lock

Catalog 4000

pivot punch corporation

January 2004


FASTGRIND



SELECTIVE CATALOG INDEX

pivot punch corporation

SELECTIVE SERIES

MULTIPLE POINT LENGTH PRECISION
PUNCHES AND DIE COMPONENTS

All Selective Series items in this section are manufactured to NAPMA standards.

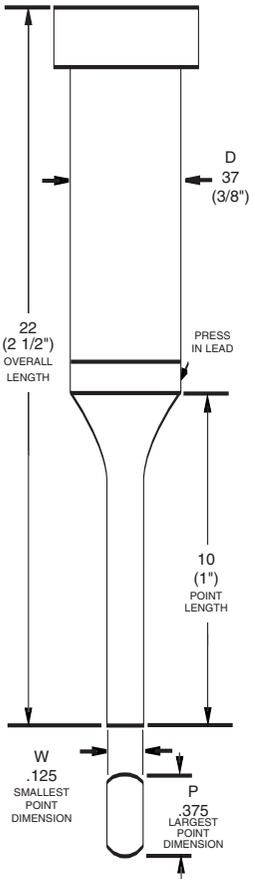
PIVOT SELECTIVE SERIES

HEAD TYPE PUNCHES,
DIE BUTTONS AND GUIDES,
EXPANDED SERIES,
PUNCHES AND DIES,
PERFORATORS

AVAILABLE FROM STOCK . . .

The complete line of precision punches, die buttons and other standard products offered in this catalog are available from stock or custom ground from stock. For your ordering convenience, Pivot maintains a complete inventory to meet your requirements in the shortest possible time.

Heads of shoulder type punches are HOT FORGED to minimize breakage. Grain flow lines are uninterrupted and conform to the contour of the head, assuring maximum structural strength.



Note: Use of W and P to show largest and smallest point dimension is common to all items shown in this catalog.

IMPORTANT: When ordering Pilot Nose Punches specify length as same dimension as piercing punch. Pilot Nose punches are furnished with 1/4" pilot nose in addition to specified length.

TONDRA®
This exclusive surface treatment, available on all HSS punches and die buttons, imparts a glass hard surface (Rockwell 72-75) and offers the ultimate in resistance to abrasion, firing and galling. Performed after finished grinding, at temp. in excess of 1000°F, this treatment affords an excellent stress relieving and imparts maximum toughness for longer punch life. Recognized by its dull, mottled oxide finish, this treatment may be varied in depth for special ratio piercing, heading, forming, drawing and shaving applications.
(.050 min.)

M2 HIGH SPEED STEEL
Recommended for a greater variety of industrial uses, including many "hot work" applications, this Molly-tough, high vanadium, high speed (M-2) tool steel offers uniform hardening quality, superior wear resistance and high impact strength.

STRAIGHT GROUND® TONDRA® TREATED
Grind lines are parallel to the axis and perpendicular to the line of potential fractures. This patented feature, exclusive with Pivot, resists wear, minimizes "pick-up" and achieves maximum strength and punchability. Available in M2 and PM.

Pivot's WHIP-SLEEVE® STRAIGHT GROUND® TONDRA® TREATED
punches are capable of piercing metal thicknesses which exceed the diameter of the punches. A vibration absorbing, inert metal sleeve is cast at the point of the punch where failure normally occurs, thus greatly increasing punch life. When used with a bushing in the stripper it eliminates whipping or shifting and transfers side thrust to the stripper rather than imposing all the force on the working point. Available in M2 and PM.

PM 3 ULTIMATE - EXTREME TOUGHNESS (IMPACT STRENGTH) AND HIGH WEAR
No high wear material has ever seen this amount of toughness before. Strength approaching S-7 material, wear exceeding M2 or D2.
AVAILABLE IN BASIC HEAD TYPE, PUNCHES, SOLID, EJECTOR AND HEAVY DUTY BALL LOCK.

PM STEEL
A unique high alloy Particle Metal Steel which provides exceptionally high wear resistance while maintaining very good toughness and strength characteristics.
Due to their exceptionally high wear resistance, PM punches have also proven to be cost-effective when replacing carbide in many applications. All Pivot PM products are triple tempered for maximum strength and toughness.

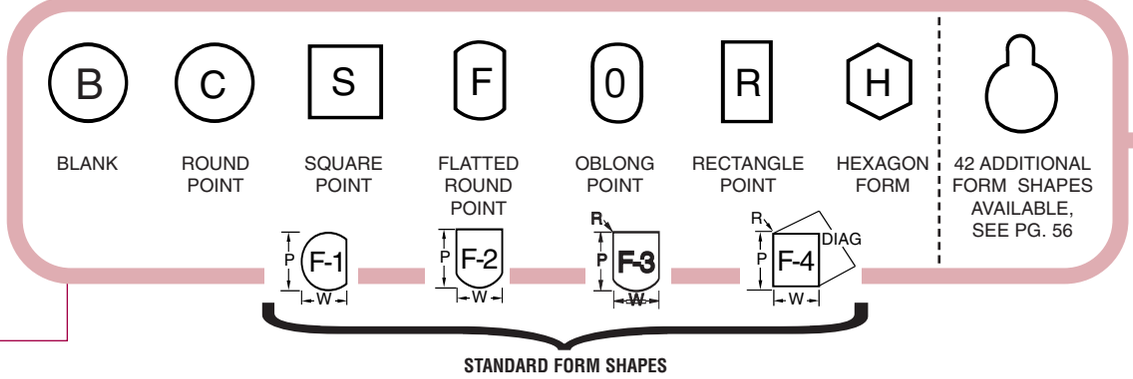
AVAILABLE IN OUR SELECTIVE SERIES.

FOR ADDITIONAL APPLICATION INFORMATION SEE COLOR-KEYED PUNCH SELECTION CHART 58-59.

Steel Shape

HOW TO ORDER H 0

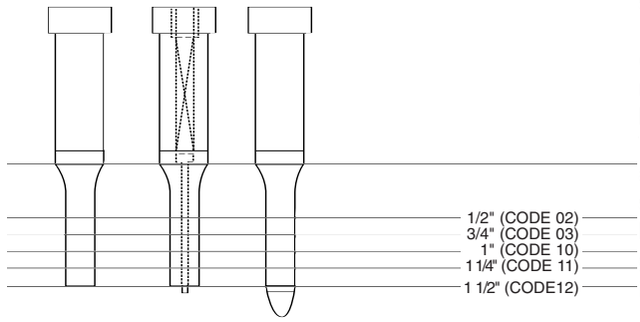
THIS SIMPLIFIED CATALOG ORDER CODE IS DESIGNED TO MAKE PUNCH, DIE BUTTON AND GUIDE BUSHING SELECTION EASIER AND MORE ACCURATE FOR YOU!



STANDARD FORM SHAPES

BODY DIAMETER — Available in 10 fractional body diameters, held to a press fit tolerance of +.0002 to +.0004. Press-in lead will be furnished unless otherwise specified. Order designation first two numerals of decimal equivalent.

OVERALL LENGTH — A full range to meet most applications. Order designation: first numeral — inch increments, second numeral — quarter inch increments

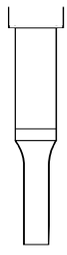


Point Length — Five selective lengths from 1/2" (code 02) to 1-1/2" (code 12) in 1/4" increments, to meet most die building requirements. These standard lengths afford the opportunity to select longer point lengths where additional guiding or point life is a factor

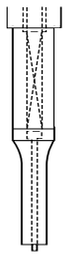
"P" LARGEST POINT DIMENSION— Available in .0001 increments at standard catalog prices. Use only where two dimensions are necessary to describe points.

"W" SMALLEST POINT DIMENSION— Available in .0001 increments at standard catalog prices. Use only where two dimensions are necessary to describe points.

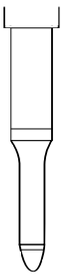
"P" PUNCH PIERCING PUNCHES IN A WIDE RANGE OF SIZES



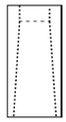
"E" EJECTOR ASSURES POSITIVE SLUG EJECTION



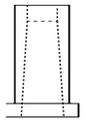
"N" PILOT NOSE FOR EXTREME ACCURACY IN LOCATING STRIPS FROM STATION TO STATION ON PROGRESSIVE DIES



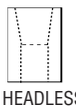
"D" PRESS FIT, HEADLESS DIE BUTTONS, M2 OR PM STEEL



"H" PRESS FIT, HEAD TYPE DIE BUTTONS, M2 OR PM STEEL

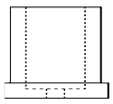


"B" HEAD-DOWN GUIDE BUSHINGS M2 STEEL ONLY



"G" HEADLESS

"S" TWO-STEP GUIDE AND STRIPPER BUSHINGS. A-2 STEEL ONLY



"T" HEAD-UP

"OVERALL LENGTH DIE BUTTONS AND GUIDES INDICATED BY TWO OR THREE DIGIT DECIMAL.

TOLERANCE AVAILABLE
(+.0002, —.0000)
TIR .0003 — for the most exacting requirements

PIVOT PUNCH CORPORATION / SELECTIVE SERIES

SOLID PUNCHES

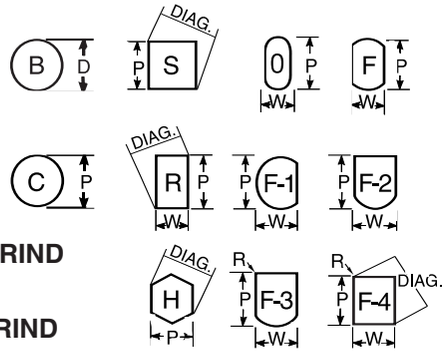
STEEL: M2 R/C 60-62
PM R/C 60-62
HEADS DRAWN R/C 40-55

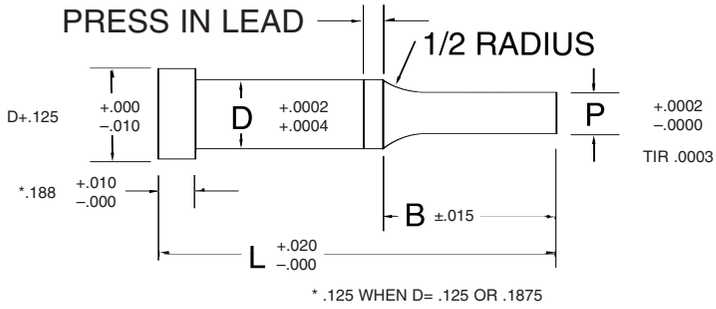
H( )P
M-2 STEEL

P( )P
PM STEEL

Y( )P
M-2 STRAIGHT GRIND

PY( )P
PM STRAIGHT GRIND





* .125 WHEN D= .125 OR .1875

Shank		Point	Round		Shape			Overall Length L											
D	Code	Length B	Min SP	Range P	Min SW	Min W	Max Diag	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
.1250	12	.50	.031	.031-.1250	.062	.062-.1250													
.1875	18		.042	.046-.1875	.062	.062-.1875													
.2500	25		.062	.062-.2500	.062	.062-.2500		1102	1202	1302	2002	2102	2202	2302	3002	3102	3202	3302	4002
.3125	31		.062	.093-.3125	.062	.093-.3125													
.3750	37		.062	.125-.3750	.080	.125-.3750													
.1250	12	.75	.042	.062-.1250	.062	.062-.1250													
.1875	18		.042	.062-.1875	.062	.062-.1875													
.2500	25		.062	.062-.2500	.062	.062-.2500													
.3125	31		.062	.093-.3125	.062	.093-.3125													
.3750	37		.062	.125-.3750	.080	.125-.3750			1203	1303	2003	2103	2203	2303	3003	3103	3203	3303	4003
.4375	43		.093	.187-.4375	.109	.187-.4375													
.5000	50		.125	.225-.5000	.125	.187-.5000													
.6250	62		.235	.310-.6250	.235	.250-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.000													
.1250	12	1.00	.058	.062-.1250	.062	.062-.1250													
.1875	18		.058	.062-.1875	.062	.062-.1875													
.2500	25		.062	.062-.2500	.062	.062-.2500													
.3125	31		.062	.093-.3125	.093	.093-.3125													
.3750	37		.062	.125-.3750	.109	.125-.3750				1310	2010	2110	2210	2310	3010	3110	3210	3310	4010
.4375	43		.093	.187-.4375	.109	.187-.4375													
.5000	50		.125	.225-.5000	.125	.187-.5000													
.6250	62		.235	.310-.6250	.235	.250-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.000													
.1250	12	1.25	.075	.093-.1250	.093	.093-.1250													
.1875	18		.075	.093-.1875	.093	.093-.1875													
.2500	25		.080	.093-.2500	.093	.093-.2500													
.3125	31		.093	.093-.3125	.093	.093-.3125													
.3750	37		.093	.125-.3750	.125	.125-.3750					2011	2111	2211	2311	3011	3111	3211	3311	4011
.4375	43		.093	.187-.4375	.141	.187-.4375													
.5000	50		.125	.225-.5000	.141	.187-.5000													
.6250	62		.234	.310-.6250	.235	.250-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.000													
.1875	18	1.50	.093	.125-.1875	.125	.125-.1875													
.2500	25		.093	.125-.2500	.125	.125-.2500													
.3125	31		.093	.125-.3125	.125	.125-.3125													
.3750	37		.125	.125-.3750	.125	.125-.3750													
.4375	43		.125	.187-.4375	.172	.187-.4375						2112	2212	2312	3012	3112	3212	3312	4012
.5000	50		.125	.225-.5000	.172	.187-.5000													
.6250	62		.234	.310-.6250	.235	.250-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.000													

UNIVERSAL CODE: 1101 (SEE PAGE 69)

HOW TO ORDER STEEL SHAPE PUNCH BODY DIA. CODE OVERALL LENGTH POINT LENGTH "P"

EJECTOR PUNCHES

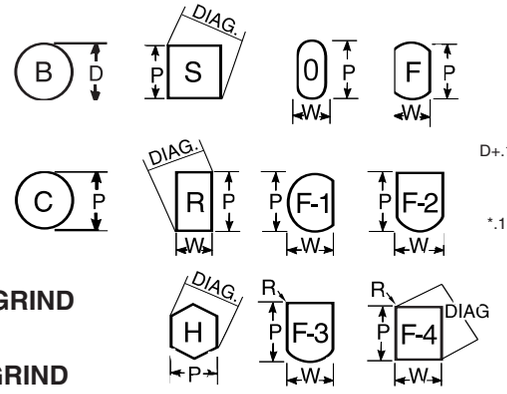
STEEL: M2 R/C 60-62
PM R/C 60-62
HEADS DRAWN R/C 40-55

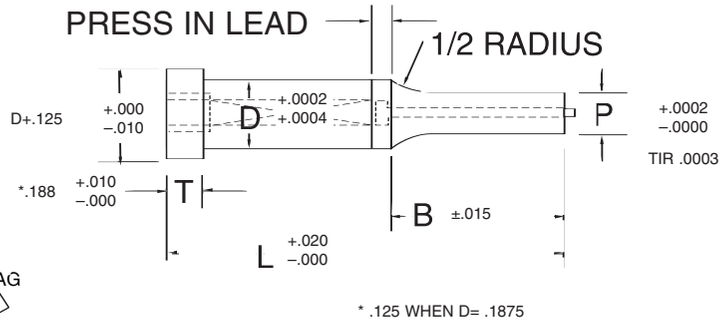
H( )E
M-2 STEEL

P( )E
PM STEEL

Y( )E
M-2 STRAIGHT GRIND

PY( )E
PM STRAIGHT GRIND





Shank		Point	Round		Shape			Overall Length L										
D	Code	Length B	Min SP	Range P	Min SW	Min W	Max Diag	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
.1875	18	.50	.050	.062-.1875	.062	.062-.1875													
.2500	25		.080	.093-.2500	.080	.093-.2500		1102	1202	1302	2002	2102	2202	2302	3002				
.3125	31		.115	.125-.3125	.115	.125-.3125										3102	3202		
.3750	37		.158	.187-.3750	.158	.187-.3750												3302	
.1875	18	.75	.050	.062-.1875	.062	.062-.1875													
.2500	25		.080	.093-.2500	.080	.093-.2500													
.3125	31		.115	.125-.3125	.115	.125-.3125													
.3750	37		.158	.187-.3750	.158	.187-.3750													4003
.4375	43		.158	.187-.4375	.158	.187-.4375			1203	1303	2003	2103	2203	2303	3003	3103	3203	3303	
.5000	50		.158	.225-.5000	.158	.250-.5000													
.6250	62		.235	.310-.6250	.235	.282-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.0000													
.1875	18	1.00	.058	.062-.1875	.093	.093-.1875													
.2500	25		.080	.093-.2500	.093	.093-.2500													
.3125	31		.115	.125-.3125	.115	.125-.3125													
.3750	37		.158	.187-.3750	.158	.187-.3750													
.4375	43		.158	.187-.4375	.158	.187-.4375				1310	2010	2110	2210	2310	3010	3110	3210	3310	4010
.5000	50		.158	.225-.5000	.158	.250-.5000													
.6250	62		.235	.310-.6250	.235	.282-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.0000													
.2500	25	1.25	.080	.093-.2500	.093	.093-.2500													
.3125	31		.115	.125-.3125	.115	.125-.3125													
.3750	37		.158	.187-.3750	.158	.187-.3750													
.4375	43		.158	.187-.4375	.158	.187-.4375													
.5000	50		.158	.225-.5000	.158	.250-.5000					2011	2111	2211	2311	3011	3111	3211	3311	4011
.6250	62		.235	.310-.6250	.235	.282-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.0000													
.3125	31	1.50	.115	.125-.3125	.115	.125-.3125													
.3750	37		.158	.187-.3750	.158	.187-.3750													
.4375	43		.158	.187-.4375	.158	.187-.3750													
.5000	50		.158	.225-.5000	.158	.250-.5000						2112	2212	2312	3012	3112	3212	3312	4012
.6250	62		.235	.310-.6250	.235	.282-.6250													
.7500	75		.300	.390-.7500	.235	.312-.7500													
.8750	87		.355	.440-.8750	.300	.343-.8750													
1.000	100		.400	.485-1.000	.235	.375-1.0000													

UNIVERSAL CODE: 1102 (SEE PAGE 69)

HOW TO ORDER

STEEL	SHAPE	PUNCH	BODY DIA. CODE	OVERALL LENGTH	POINT LENGTH		"P"		"W"
H	O	E	37	22	10	X	.250	X	.125

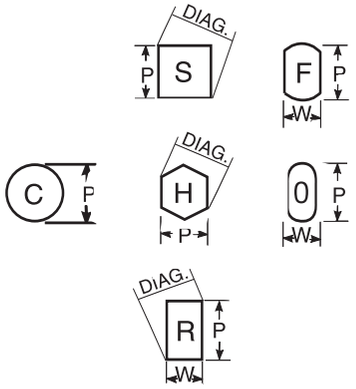
PIVOT PUNCH CORPORATION / SELECTIVE SERIES

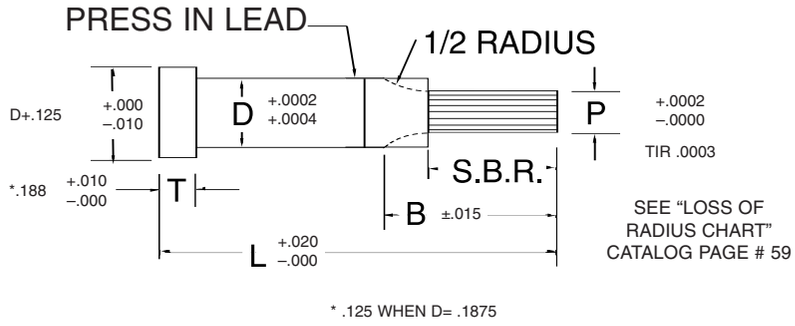
SOLID WHIPSLEEVE PUNCHES

STEEL: M-2 R/C 60/62
PM R/C 60/62
HEADS DRAWN TO R/C 40-55

X( )P
M-2 STEEL

PX( )P
PM STEEL





SEE "LOSS OF RADIUS CHART" CATALOG PAGE # 59

* .125 WHEN D= .1875

Shank		Point	Round		Shape			Overall Length L								
D	Code	Length B	Min SP	Range P	Min SW	Min W	Max Diag	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50
.1875	18	.50	.042	.046-.109	.062	.062-.109										
.2500	25		.062	.062-.125	.062	.062-.125		1202								
.3125	31		.062	.093-.172	.062	.093-.172			1302	2002	2102	2202				
.3750	37		.062	.125-.218	.080	.125-.218										
.1875	18	.75	.042	.062-.109	.062	.062-.109										
.2500	25		.062	.062-.125	.062	.062-.125										
.3125	31		.062	.093-.172	.062	.093-.172			1303							
.3750	37		.062	.125-.218	.080	.125-.218				2003						
.4375	43		.093	.187-.250	.109	.187-.250										
.5000	50		.125	.225-.297	.125	.187-.297					2103	2203	2303			
.6250	62		.235	.310-.375	.235	.250-.375								3003	3103	
.7500	75		.300	.390-.500	.235	.312-.500										
1.000	100		.400	.485-.687	.235	.375-.687										
.1875	18	1.00	.058	.062-.109	.062	.062-.109										
.2500	25		.062	.062-.125	.062	.062-.125										
.3125	31		.062	.093-.172	.093	.093-.172										
.3750	37		.062	.125-.218	.109	.125-.218										
.4375	43		.093	.187-.250	.109	.187-.250				2010	2110	2210	2310	3010		
.5000	50		.125	.225-.297	.125	.187-.297									3110	3210
.6250	62		.235	.310-.375	.235	.250-.375										
.7500	75		.300	.390-.500	.235	.312-.500										
1.000	100		.400	.485-.687	.235	.375-.687										
.1875	18	1.25	.075	.062-.109	.093	.093-.109										
.2500	25		.080	.093-.125	.093	.093-.125										
.3125	31		.093	.093-.172	.093	.093-.172										
.3750	37		.093	.125-.218	.125	.125-.218										
.4375	43		.093	.187-.250	.141	.187-.250					2111	2211	2311	3011		
.5000	50		.125	.225-.297	.141	.187-.297									3111	3211
.6250	62		.234	.310-.375	.235	.250-.375										
.7500	75		.300	.390-.500	.235	.312-.500										
1.000	100		.400	.485-.687	.235	.375-.687										
.3125	31	1.50	.093	.125-.172	.125	.125-.172										
.3750	37		.125	.125-.218	.125	.125-.218										
.4375	43		.125	.187-.250	.172	.187-.250										
.5000	50		.125	.225-.297	.172	.187-.297						2212	2312	3012	3112	3212
.6250	62		.235	.310-.375	.235	.250-.375										
.7500	75		.300	.390-.500	.235	.312-.500										
1.000	100		.400	.485-.687	.235	.375-.687										

HOW TO ORDER

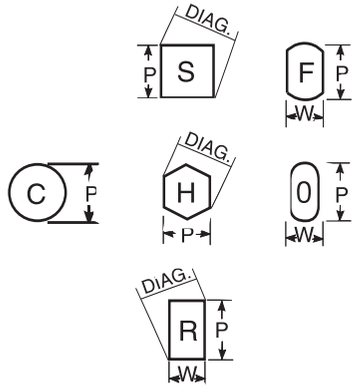
TYPE	SHAPE	PUNCH	BODY DIA. CODE	OVERALL LENGTH	POINT LENGTH	"P"
X	C	P	37	22	10	.187

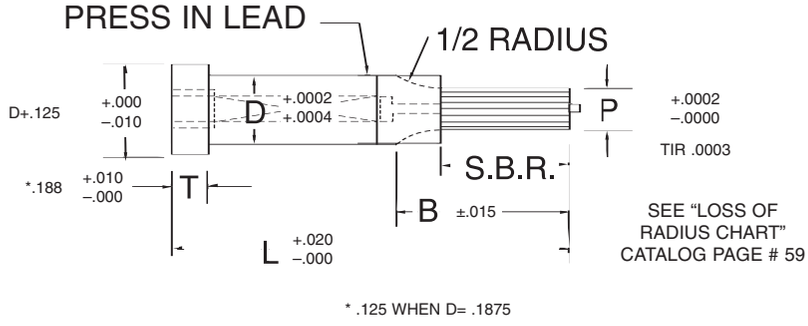
EJECTOR WHIPSLEEVE PUNCHES

STEEL: M-2 R/C 60/62
PM R/C 60/62
HEADS DRAWN TO R/C 40-55

X( )E
M-2 STEEL

PX( )E
PM STEEL





SEE "LOSS OF RADIUS CHART" CATALOG PAGE # 59

* .125 WHEN D= .1875

Shank		Point Length	Round		Shape			Overall Length L								
D	Code	B	Min SP	Range P	Min SW	Min W	Max Diag	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50
.1875	18	.50	.042	.046-.109	.062	.062-.109										
.2500	25		.062	.062-.125	.062	.062-.125		1202								
.3125	31		.062	.093-.172	.062	.093-.172			1302	2002	2102	2202				
.3750	37		.062	.125-.218	.080	.125-.218										
.1875	18	.75	.042	.062-.109	.062	.062-.109										
.2500	25		.062	.062-.125	.062	.062-.125										
.3125	31		.062	.093-.172	.062	.093-.172			1303							
.3750	37		.062	.125-.218	.080	.125-.218				2003						
.4375	43		.093	.187-.250	.109	.187-.250										
.5000	50		.125	.225-.297	.125	.187-.297					2103	2203	2303			
.6250	62		.235	.310-.375	.235	.250-.375								3003	3103	
.7500	75		.300	.390-.500	.235	.312-.500										
1.000	100		.400	.485-.687	.235	.375-.687										
.2500	25	1.00	.062	.062-.125	.062	.062-.125										
.3125	31		.062	.093-.172	.093	.093-.172										
.3750	37		.062	.125-.218	.109	.125-.218				2010						
.4375	43		.093	.187-.250	.109	.187-.250										
.5000	50		.125	.225-.297	.125	.187-.297					2110	2210	2310	3010		
.6250	62		.235	.310-.375	.235	.250-.375									3110	3210
.7500	75		.300	.390-.500	.235	.312-.500										
1.000	100		.400	.485-.687	.235	.375-.687										
.3125	31	1.25	.093	.093-.172	.093	.093-.172										
.3750	37		.093	.125-.218	.125	.125-.218										
.4375	43		.093	.187-.250	.141	.187-.250										
.5000	50		.125	.225-.297	.141	.187-.297					2111	2211	2311	3011		
.6250	62		.234	.310-.375	.235	.250-.375									3111	3211
.7500	75		.300	.390-.500	.235	.312-.500										
1.000	100		.400	.485-.687	.235	.375-.687										

HOW TO ORDER

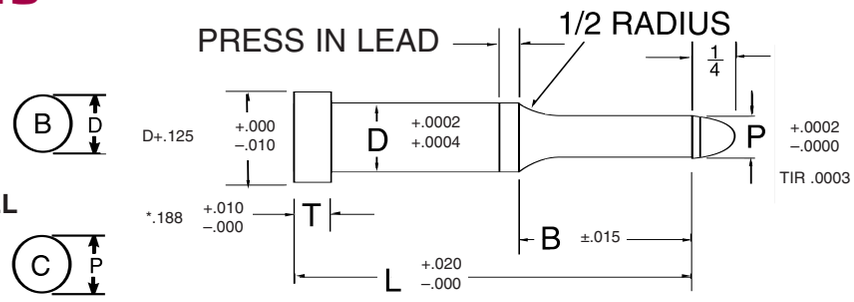
TYPE	SHAPE	PUNCH	DIA.	BODY CODE	OVERALL LENGTH	POINT LENGTH	"P"
X	C	E		37	22	10	.187

PILOTS

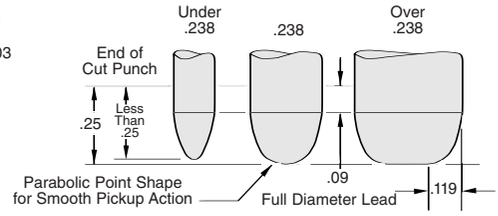
STEEL: M-2 R/C 60/62
HEADS DRAWN TO R/C 40-55

H( )N

M-2 STEEL



* .125 WHEN D= .125 OR .1875



UNIVERSAL CODE: 110107 (SEE PAGE 69)

Shank		Point	Round		Length L											
D	Code	Length B	Min SP	Range P	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
.1250	12	.50	.050	.061-.1250												
.1875	18		.050	.061-.1875												
.2500	25		.061	.061-.2500	1102	1202	1302	2002	2102	2202	2302	3002				
.3125	31		.061	.092-.3125									3102	3202		
.3750	37		.061	.124-.3750											3302	4002
.1250	12	.75	.050	.061-.1250												
.1875	18		.050	.061-.1875												
.2500	25		.061	.061-.2500												
.3125	31		.061	.092-.3125												
.3750	37		.061	.124-.3750												
.4375	43		.092	.186-.4375		1203	1303	2003	2103	2203	2303	3003	3103	3203	3303	4003
.5000	50		.124	.224-.5000												
.6250	62		.234	.309-.6250												
.7500	75		.299	.389-.7500												
.8750	87		.354	.439-.8750												
1.0000	100		.399	.484-1.0000												
.1250	12	1.00	.057	.061-.1250												
.1875	18		.057	.061-.1875												
.2500	25		.061	.061-.2500												
.3125	31		.061	.092-.3125												
.3750	37		.061	.124-.3750												
.4375	43		.092	.186-.4375			1310	2010	2110	2210	2310	3010	3110	3210	3310	4010
.5000	50		.124	.224-.5000												
.6250	62		.234	.309-.6250												
.7500	75		.299	.389-.7500												
.8750	87		.354	.439-.8750												
1.0000	100		.399	.484-1.0000												
.1250	12	1.25	.074	.092-.1250												
.1875	18		.074	.092-.1875												
.2500	25		.079	.092-.2500												
.3125	31		.092	.092-.3125												
.3750	37		.092	.124-.3750												
.4375	43		.092	.186-.4375				2011	2111	2211	2311	3011	3111	3211	3311	4011
.5000	50		.124	.224-.5000												
.6250	62		.234	.309-.6250												
.7500	75		.299	.389-.7500												
.8750	87		.354	.439-.8750												
1.0000	100		.399	.484-1.0000												
.1875	18	1.50	.092	.124-.1875												
.2500	25		.092	.124-.2500												
.3125	31		.092	.124-.3125												
.3750	37		.124	.124-.3750												
.4375	43		.124	.186-.4375					2112	2212	2312	3012	3112	3212	3312	4012
.5000	50		.124	.224-.5000												
.6250	62		.234	.309-.6250												
.7500	75		.299	.389-.7500												
.8750	87		.354	.439-.8750												
1.0000	100		.399	.484-1.0000												

HOW TO ORDER

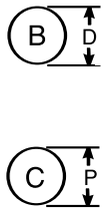
STEEL	SHAPE	PUNCH	BODY DIA. CODE	"L" LENGTH	POINT LENGTH	"P"
H	C	N	37	22	10	X .250

HIGH SPEED LONG NOSE PILOTS

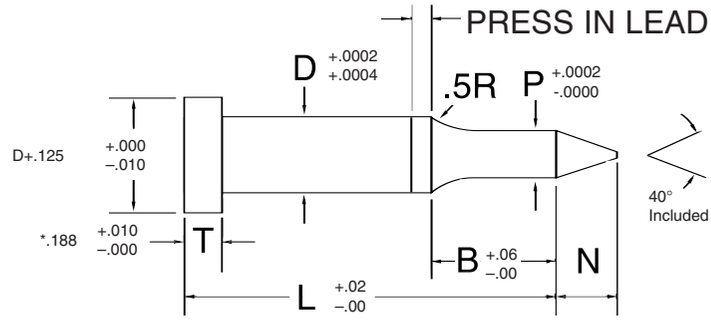
STEEL: M-2 R/C 60/62
HEADS DRAWN TO R/C 40-55

HLN( )

M-2 STEEL ONLY



Positive Pick Up Pilots

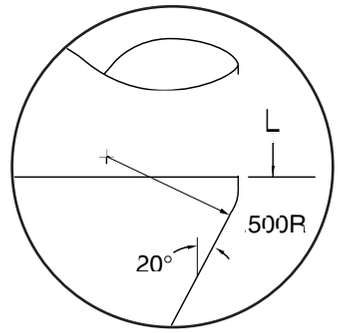


UNDER .186 SP PILOT NOSE IS 1.5P

P Tolerance +.0002 –.0000

P to D + .0003 T.I.R.

When P = D Tolerance is +.0002 +.0004



UNIVERSAL CODE: 110108 (SEE PAGE 69)

Shank		Point	Round			Length L												
D	Code	Length B	Min SP	Range P	Max N	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50
.3750	37	.75	.092	.186-.3750	.37													
.4375	43		.092	.186-.4375	.43													
.5000	50		.124	.224-.5000	.50	2203	2303	3003	3103	3203	3303	4003	4103	4203	4303	5003	5103	5203
.6250	62		.234	.309-.6250	.62													
.7500	75		.299	.389-.7500	.75													
.8750	87		.354	.439-.875	.87													
1.000	100		.399	.484-1.000	1.00													
.3750	37	1.00	.092	.186-.3750	.37													
.4375	43		.092	.186-.4375	.43													
.5000	50		.124	.224-.5000.	.50	2210	2310	3010	3110	3210	3310	4010	4110	4210	4310	5010	5110	5210
.6250	62		.234	.309-.6250	.62													
.7500	75		.299	.389-.7500	.75													
.8750	87		.354	.439-.875	.87													
1.000	100		.399	.484-1.000	1.00													
.3750	37	1.25	.092	.186-.3750	.37													
.4375	43		.092	.186-.4375	.43													
.5000	50		.124	.224-.5000	.50	2211	2311	3011	3111	3211	3311	4011	4111	4211	4311	5011	5111	5211
.6250	62		.234	.309-.7500	.62													
.7500	75		.299	.389-.7500	.75													
.8750	87		.354	.439-.875	.87													
1.000	100		.399	.484-1.000	1.00													

HOW TO ORDER

HIGH SPEED LONG NOSE PILOT	BODY DIA. CODE	"L" LENGTH	POINT LENGTH		"P"
HLNC	50	32	10	X	.375

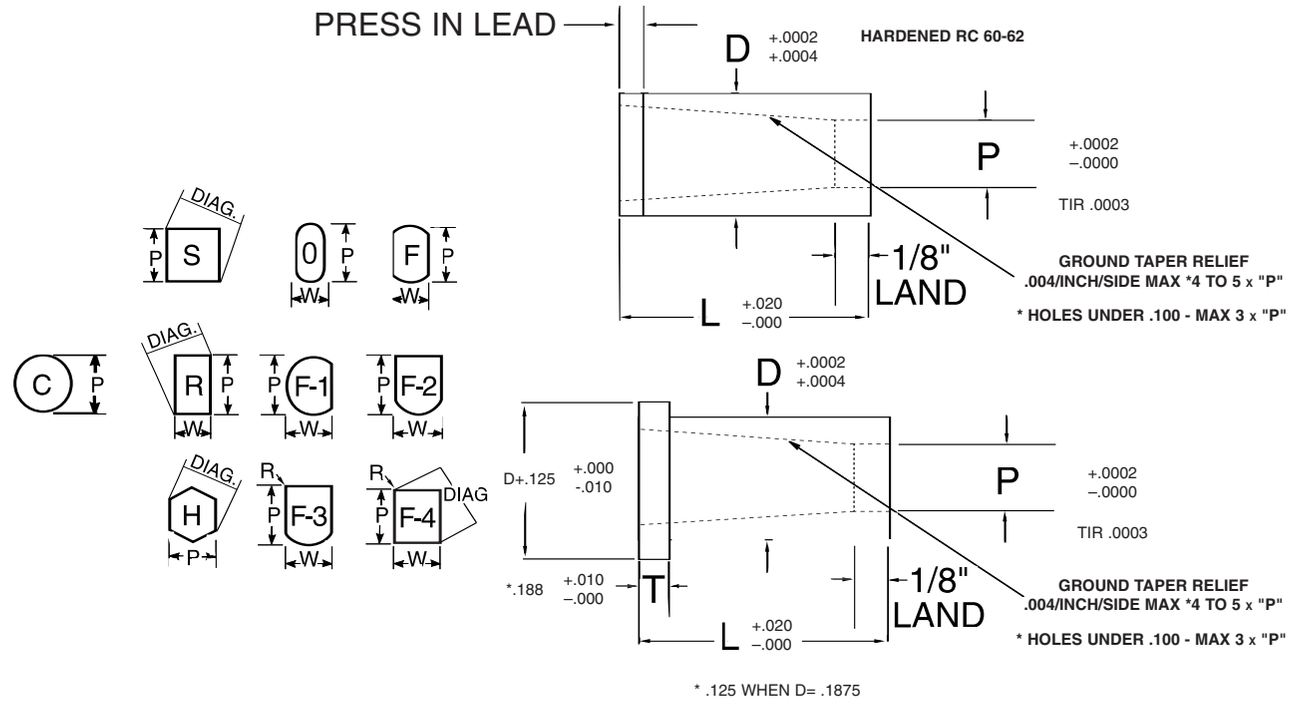
PRESS FIT DIE BUTTONS

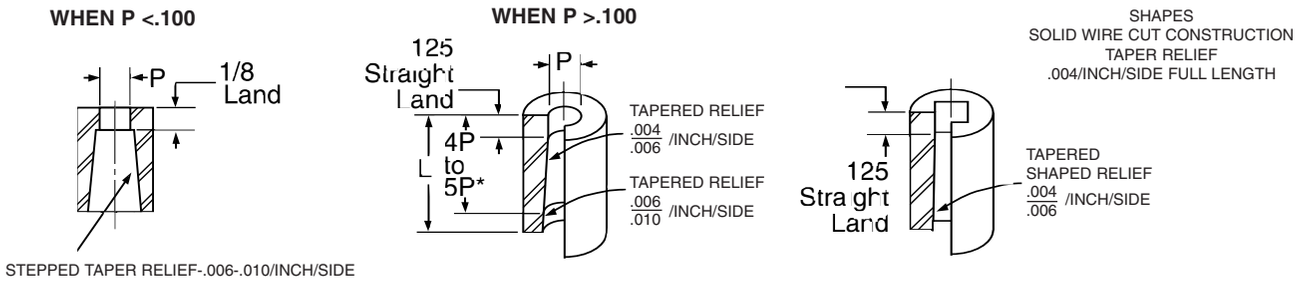
HCD
H( )DW
HEADLESS
M-2 STEEL

HCH
H( )HW
HEADED
M-2 STEEL

PCD
P( )DW
HEADLESS
PM STEEL

PCH
P( )HW
HEADED
PM STEEL





UNIVERSAL CODE: 1153 & 1154 (SEE PAGE 69)

Body		Round	Shape	Overall Length L								
D	Code	Range P	Min. W / Max. DIAG.	.500	.625	.750	.875	1.000	1.125	1.250	1.375	1.500
.1875	18	.038-.130	.050- .130									
.2500	25	.050-.170	.050- .170									
.3125	31	.062-.212	.050- .212	50	62	75	87	100	112			
.3750	37	.075-.255	.050- .255							125	137	150
.4375	43	.130-.297	.075- .297									
.5000	50	.150-.344	.075- .344	50	62							
.6250	62	.188-.425	.075- .425			75	87	100	112	125	137	150
.7500	75	.225-.510	.075- .510									
.8750	87	.300-.595	.075- .595									
1.000	100	.400-.680	.075- .680									
1.250	125	.500-.850	.075- .850			75	87	100	112	125	137	150

HOW TO ORDER

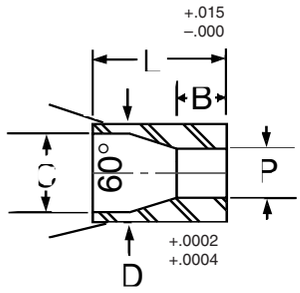
STEEL	SHAPE	HEAD DIE	BODY DIA.	OVERALL LENGTH		"P"
H	C	H	100	- 112	X	.625

HOW TO ORDER

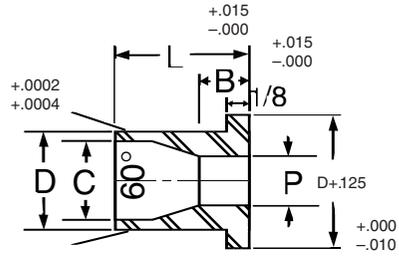
STEEL	SHAPE	PRESS FIT DIE	WIRE	BODY DIA.	OVERALL LENGTH		"P"		"W"
H	F	D	W	100	112	X	.437	X	.187

GUIDE BUSHINGS

HCG
H( )GW
HEADLESS

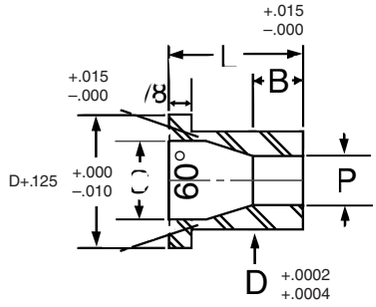


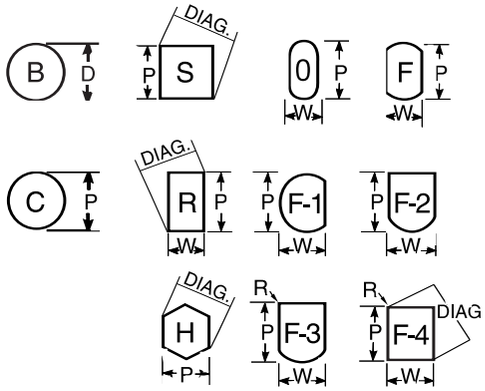
HCB
H( )BW
HEAD DOWN



P
+.0002 –.0000
TIR .0003

HCT
H( )TW
HEAD UP





Guide Chart

Hole Range P/DIAG	Land Length B
Up to .0650	2P
.0651-.0950	P + .065
.0951-.4250	.80P + .080

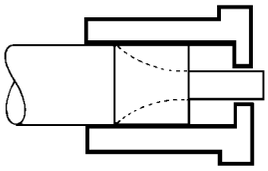
UNIVERSAL CODE: 1131, 1132, 1133 (SEE PAGE 69)

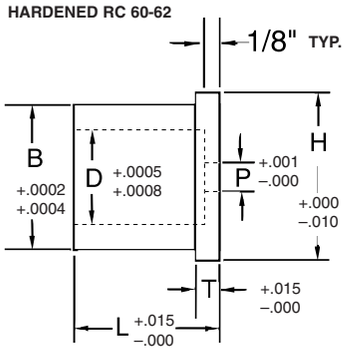
Body		Round	Shape		C'Bore	Overall Length L				
D	Code	Range P	Min. W	Max. DIAG	Dia. C	.3125	.375	.500	.625	Code
.1875	18	.062-.130	.050-	.130	.141	31				18
.2500	25	.062-.170	.050-	.170	.201					25
.3125	31	.093-.212	.050-	.212	.261		37			31
.3750	37	.125-.255	.050-	.255	.323			50	62	37
.4375	43	.187-.297	.075-	.297	.386					43
.5000	50	.212-.344	.075-	.344	.448					50
.6250	62	.293-.425	.075-	.425	.515					62

HOW TO ORDER

STEEL	SHAPE	PRESS-FIT GUIDE	WIRE	BODY DIA.		OVERALL LENGTH		"P"		"W"
H	O	G	W	50	-	62	X	.250	X	.062

TWO-STEP STRIPPER GUIDES

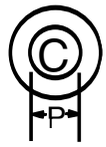




"P", "D" & "B" CONCENTRIC WITHIN .0005 T. I. R.

TWO-STEP STRIPPER GUIDES

This two-step stripper guide is to be used when guiding on the punch shank is required and where it is necessary to strip closely around the punch point.



ROUND HOLE ORDER **ACS**

STEEL	CYLINDRICAL	SHANK GUIDE	BODY DIAMETER	HEAD DIAMETER	HEAD THICKNESS	HOLE SIZE	L - OVERALL LENGTH						P	
			B	H	T	D	5/8	15/16	1-7/32	1-1/4	1-1/2	1-3/4	MIN.	MAX.
A	C	S	3/8	1/2	3/16	3/16	37-62						.050	.109
A	C	S	1/2	5/8	3/16	1/4		50-93					.050	.125
A	C	S	5/8	3/4	3/16	5/16		62-93					.062	.172
A	C	S	5/8	3/4	3/16	3/8		62A-93					.093	.218
A	C	S	7/8	1	3/16	1/2			87-121				.125	.297
A	C	S	1	1-1/8	3/16	5/8				100-125			.203	.375
A	C	S	1-1/8	1-1/4	3/16	3/4					112-150		.281	.500
A	C	S	1-1/4	1-3/8	3/16	7/8					125-150	125-175	.370	.595
A	C	S	1-3/8	1-1/2	3/16	1					137-150	137-175	.468	.687

HOW TO ORDER

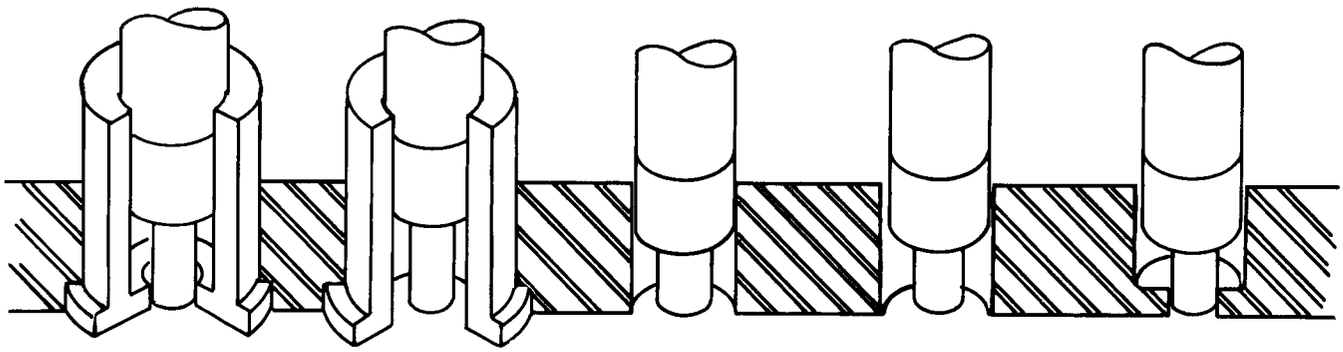
STEEL	SHAPE	PUNCH	BODY DIA.	OVERALL LENGTH	"P"
A	C	S	87 -	121	X .250

WHEN ORDERING WHIPSLEEVE PUNCHES:

1. Use shortest possible point length for added strength on critical punches.
2. Use largest practical size shank in relation to point diameter.
3. Use maximum punch and die clearance wherever possible.
4. Consider hardness as well as thickness of material to be punched in relation to point diameter. (In most cases, the XS punch will penetrate thickness as much as twice the diameter of the punch, — replacing many drilling operations.)
5. Provide depth stop so that punches cannot be set too deep.
6. Provide taper on die sections or die buttons all the way through.
7. Provide taper slug clearance in die shoe.

WHEN GUIDING IN STRIPPER BUSHING:
Make certain the whipsleeve is an easy slip-fit in the guide bushing. When guiding in the stripper itself use 4140 steel or equivalent, hardness approx. 300 Brinell, heat treated before machining. Be sure whipsleeve is engaged in guide before punch contacts material.

Pivot Punches are supplied without guides. Use "ACS" Stripper Guide Bushings, Standard Drill Bushings, or the type of guide that will give the punch the proper support for the particular application. Examples are shown below:



"ACS" TWO-STEP STRIPPER GUIDE Guide on shank Clearance on point

STRIPPER GUIDE Guide on shank

PUNCH GUIDED IN STRIPPER

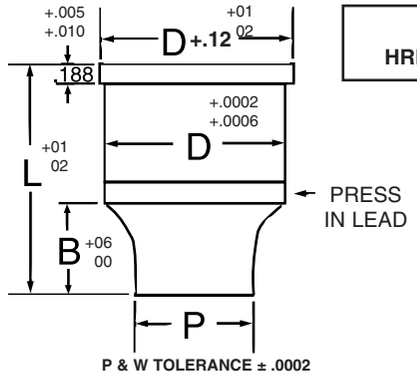
CLEARANCE HOLE IN STRIPPER No guide

COUNTER BORED HOLE IN STRIPPER No guide

EXPANDED SERIES HEAD-TYPE PUNCHES

SOLID

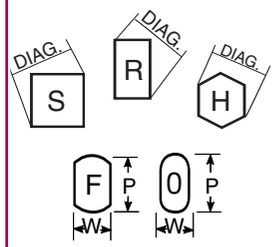
M-2
RC 60-62



HOW TO ORDER:
HRP 175 2311 1.323 .707

H ( ) P

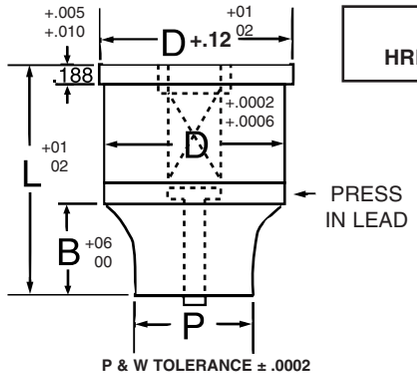
STANDARD SHAPES



CATALOG CODE	BODY DIAMETER D	POINT LENGTH B	L - OVERALL LENGTH 2-1/4	2-1/2	2-3/4	3	3-1/4	ROUND PT. MIN. P MAX.		STANDARD SHAPES MIN. W	MAX. DIAG.
H( )P	1 -1/4	1-1/4	125-2111	125-2211	125-2311	125-3011	125-3111	.625	1.250	.282	1.250
		1-1/2	125-2112	125-2212	125-2312	125-3012	125-3112				
H( )P	1 -1/2	1-1/4	150-2111	150-2211	150-2311	150-3011	150-3111	.750	1.500	.300	1.500
		1-1/2	150-2112	150-2212	150-2312	150-3012	150-3112				
H( )P	1-3/4	1-1/4	175-2111	175-2211	175-2311	175-3011	175-3111	1.000	1.750	.350	1.750
		1-1/2	175-2112	175-2212	175-2312	175-3012	175-3112				
H( )P	2	1-1/4	200-2111	200-2211	200-2311	200-3011	200-3111	1.187	2.000	.400	2.000
		1-1/2	200-2112	200-2212	200-2312	200-3012	200-3112				
H( )P	2-1/4	1-1/4	225-2111	225-2211	225-2311	225-3011	225-3111	1.375	2.250	.450	2.250
		1-1/2	225-2112	225-2212	225-2312	225-3012	225-3112				
H( )P	2-1/2	1-1/4	250-2111	250-2211	250-2311	250-3011	250-3111	1.625	2.500	.500	2.500
		1-1/2	250-2112	250-2212	250-2312	250-3012	250-3112				

EJECTOR

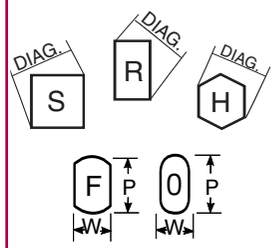
M-2
RC 60-62



HOW TO ORDER:
HRE 175 2311 1.323 .707

H ( ) E

STANDARD SHAPES



CATALOG CODE	BODY DIAMETER D	POINT LENGTH B	L - OVERALL LENGTH 2-1/4	2-1/2	2-3/4	3	3-1/4	ROUND PT. MIN. P MAX.		STANDARD SHAPES MIN. W	MAX. DIAG.
H( )E	1 -1/4	1-1/4	125-2111	125-2211	125-2311	125-3011	125-3111	.625	1.250	.282	1.250
		1-1/2	125-2112	125-2212	125-2312	125-3012	125-3112				
H( )E	1 -1/2	1-1/4	150-2111	150-2211	150-2311	150-3011	150-3111	.750	1.500	.300	1.500
		1-1/2	150-2112	150-2212	150-2312	150-3012	150-3112				
H( )E	1-3/4	1-1/4	175-2111	175-2211	175-2311	175-3011	175-3111	1.000	1.750	.350	1.750
		1-1/2	175-2112	175-2212	175-2312	175-3012	175-3112				
H( )E	2	1-1/4	200-2111	200-2211	200-2311	200-3011	200-3111	1.187	2.000	.400	2.000
		1-1/2	200-2112	200-2212	200-2312	200-3012	200-3112				
H( )E	2-1/4	1-1/4	225-2111	225-2211	225-2311	225-3011	225-3111	1.375	2.250	.450	2.250
		1-1/2	225-2112	225-2212	225-2312	225-3012	225-3112				
H( )E	2-1/2	1-1/4	250-2111	250-2211	250-2311	250-3011	250-3111	1.625	2.500	.500	2.500
		1-1/2	250-2112	250-2212	250-2312	250-3012	250-3112				

EXPANDED SERIES HEAD-TYPE DIES

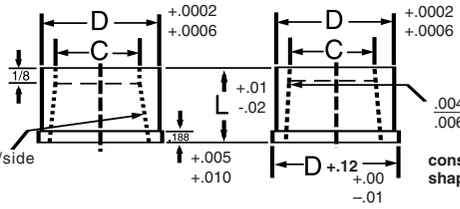
HOW TO ORDER:
HOHW 200-100 1.450 .650

HCH 

Solid
H ( ) HW

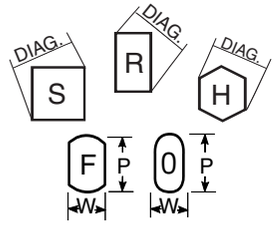
M-2
RC 60-62

HCH H ( ) HW



ROUND PT.

STANDARD SHAPES



BODY DIA.		L - OVERALL LENGTH						
HCH	H ( ) HW	3/4"	1"	1-1/4"	MIN. P	MAX.	MIN. W	MAX. DIAG.
1-1/2	1-1/2	150-75	150-100	150-125	.600	1.050	.130	1.050
1-3/4	1-3/4	175-75	175-100	175-125	.750	1.400	.130	1.400
2	2	200-75	200-100	200-125	.875	1.600	.130	1.600
2-1/4	2-1/4	225-75	225-100	225-125	1.000	1.800	.130	1.800
2-1/2	2-1/2	250-75	250-100	250-125	1.125	2.000	.130	2.000
2-3/4	2-3/4	275-75	275-100	275-125	1.250	2.200	.130	2.200

EXPANDED SERIES HEADLESS DIES

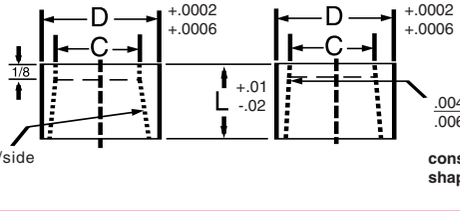
HOW TO ORDER:
HODW 200-100 1.450 .650

HCD 

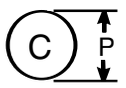
Solid
H ( ) DW

M-2
RC 60-62

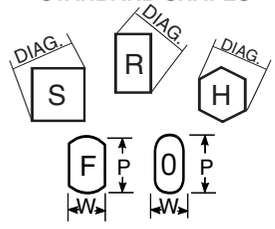
HCD H ( ) DW



ROUND PT.



STANDARD SHAPES

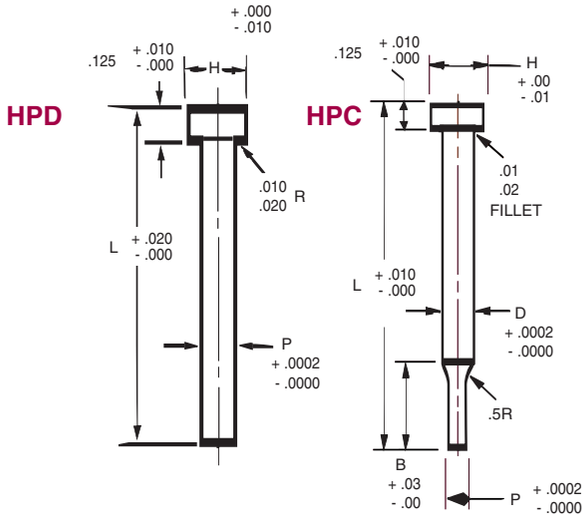


BODY DIA.		L - OVERALL LENGTH						
HCD	H ( ) DW	3/4"	1"	1-1/4"	MIN. P	MAX.	MIN. W	MAX. DIAG.
1-1/2	1-1/2	150-75	150-100	150-125	.600	1.050	.130	1.050
1-3/4	1-3/4	175-75	175-100	175-125	.750	1.400	.130	1.400
2	2	200-75	200-100	200-125	.875	1.600	.130	1.600
2-1/4	2-1/4	225-75	225-100	225-125	1.000	1.800	.130	1.800
2-1/2	2-1/2	250-75	250-100	250-125	1.125	2.000	.130	2.000
2-3/4	2-3/4	275-75	275-100	275-125	1.250	2.200	.130	2.200

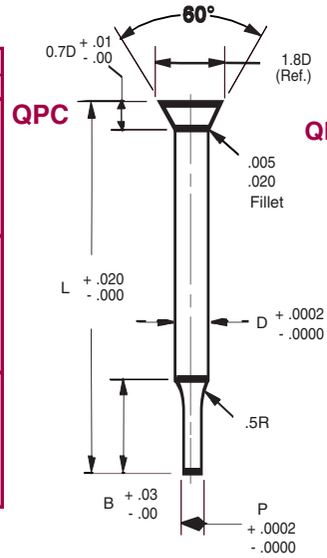
PRECISION PERFORATORS BLANK & POINTED

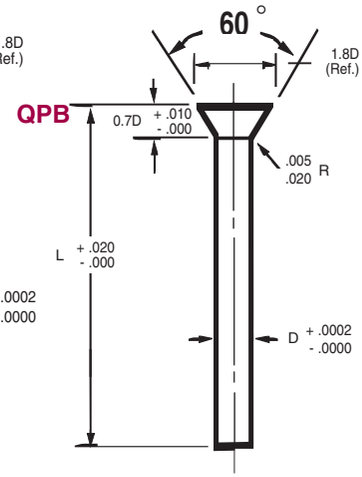
STEEL: M2 R/C 60-63
HEADS DRAWN TO R/C 40-50 (HPD)
(QPD)

HEAD TYPE
HPD
HPC
HPB
QUILL TYPE
QPD
QPC
QPB

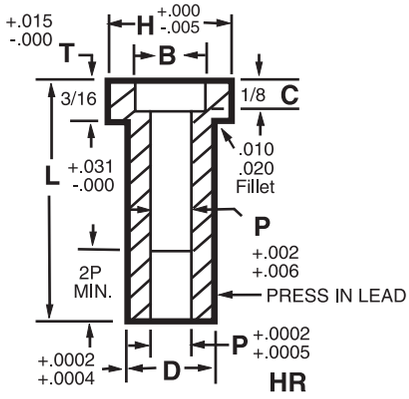


Shank D	Shank Code	Head Dia. H	Point Length B	Range P	Overall Length L 1.50	1.75	2.00	2.25	2.50
Straight Punches **HPD QPD**	N/A	.125 .160 .190 .220 .250 .282 .313	N/A	.0300-.0630 .0631-.0940 .0941-.1250 .1251-.1570 .1571-.1880 .1881-.2190 .2191-.2500	150	175	200	225	250
Regular Punches **HPC QPC** .0625	06	.125	.19	.0310-.0624					
.0938	09	.160	.25	.0626-.0937					
.1250	12	.190	.31	.0939-.1249					
.1562	15	.220	.31	.1251-.1561	150	175	200	225	250
.1875	18	.250	.31	.1563-.1874					
.2188	21	.282	.31	.1876-.2187					
.2500	25	.313	.31	.2189-.2499					
Punch Blanks **HPB QPB** .0625	06	.125	N/A						
.0938	09	.160							
.1250	12	.190							
.1562	15	.220			150	175	200	225	250
.1875	18	.250							
.2188	21	.282							
.2500	25	.313							





PRECISION RETAINERS

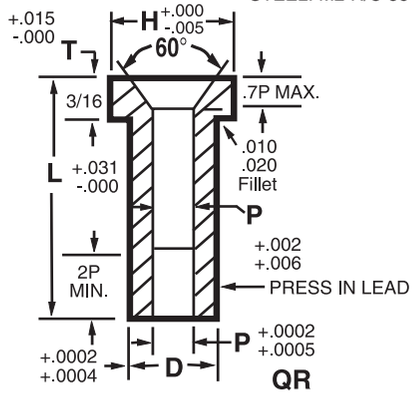


precision retainers

SERIES
HR
M2 STEEL
R/C 58-62

SERIES
QR
M2 STEEL
R/C 58-62

STEEL: M2 R/C 58-62



CAT. NO.	D	H	B	P	Overall Lengths Available (L) 3/4	1	1 1/4	1 1/2	1 3/4	CAT. NO.	D	H	P
HR-18	3/16	5/16	9/64	.0625	X	X	X			QR-18	3/16	5/16	.0625
HR-25	1/4	3/8	11/64	.0938	X	X	X			QR-25	1/4	3/8	.0938
HR-31	5/16	7/16	13/64	.1250	X	X	X	X	X	QR-31	5/16	7/16	.1250
HR-37	3/8	1/2	15/64	.1562	X	X	X	X	X	QR-37	3/8	1/2	.1562
HR-43	7/16	9/16	17/64	.1875	X	X	X	X	X	QR-43	7/16	9/16	.1875
HR-50	1/2	5/8	19/64	.2178	X	X	X	X	X	QR-50	1/2	5/8	.2178
HR-62	5/8	3/4	21/64	.2500	X	X	X	X	X	QR-62	5/8	3/4	.2500

HOW TO ORDER

CAT. NO.	OVERALL LENGTH	"P"
QR-37	1	.1562

STANDARD ALTERATIONS

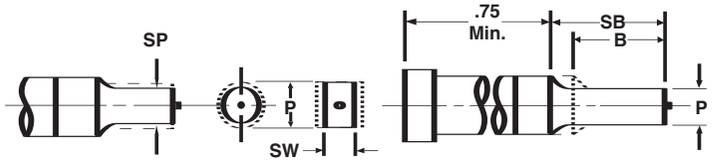
Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge. Does not add to delivery unless noted.

Ejector Punch

H( )E P( )E Y( )E PY( )E

SP, SW P & W Dimensions Smaller than Standard

SB Point Length Longer than Standard



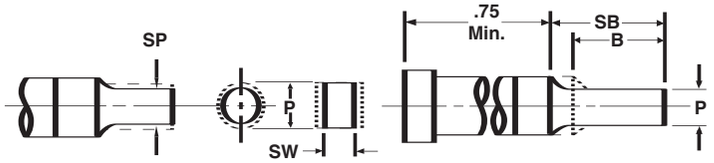
Point Length ▶	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625
Code	Min. P (Rounds)					Min. W (Shapes)				
18	.050	.058				.062	.093			
25	.080	.080	.080			.080	.093	.093.		
31	.115	.115	.115	.115	.115	.115	.115	.115	.115	.115
37	.158	.158	.158	.158	.158	.158	.158	.158	.158	.158
43	.158	.158	.158	.158	.158	.158	.158	.158	.158	.158
50	.158	.158	.158	.158	.158	.158	.158	.158	.158	.158
62	.235	.235	.235	.235	.235	.235	.235	.235	.235	.235
75	.300	.300	.300	.300	.300	.235	.235	.235	.235	.235
87 or 100	.400	.400	.400	.400	.400	.235	.235	.235	.235	.235

Solid

H( )P P( )P Y( )P PY( )P

SP, SW P & W Dimensions Smaller than Standard

SB Point Length Longer than Standard

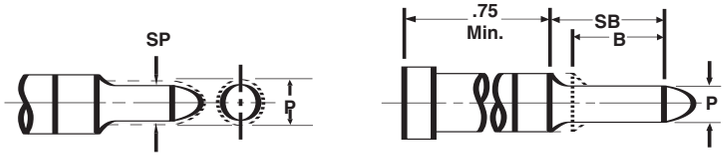


Point Length ▶	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625
Code	Min. P (Rounds)					Min. W (Shapes)				
12	.042*	.058	.075			.062	.062	.093		
18	.042*	.058	.075	.093		.062	.062	.093	.125	
25	.062	.062	.080	.093		.062	.062	.093	.125	
31	.062	.062	.093	.093	.125	.062	.093	.093	.125	.195
37	.062	.062	.093	.125	.125	.080	.109	.125	.125	.195
43	.093	.093	.093	.125	.125	.109	.109	.141	.172	.195
50	.125	.125	.125	.125	.125	.125	.125	.141	.172	.195
62	.235	.235	.235	.235	.235	.235	.235	.235	.235	.235
75	.300	.300	.300	.300	.300	.235	.235	.235	.235	.235
87 or 100	.400	.400	.400	.400	.400	.235	.235	.235	.235	.235

Pilots H( )N

SP, SW P & W Dimensions Smaller than Standard

SB Point Length Longer than Standard



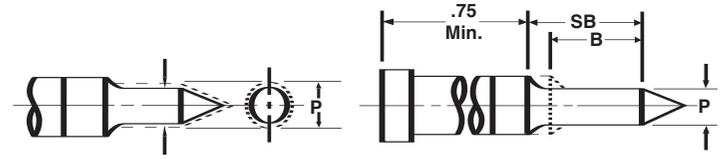
Point Length ▶	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625
Code	Min. P (Rounds)				
12	.050	.057	.074		
18	.050	.057	.074	.092	
25	.061	.061	.079	.092	
31	.061	.061	.092	.092	.124
37	.061	.061	.092	.124	.124
43	.092	.092	.092	.124	.124
50	.124	.124	.124	.124	.124
62	.234	.234	.234	.234	.234
75	.299	.299	.299	.299	.299
87 or 100	.399	.399	.399	.399	.399

Long Nose Pilots

HLN( )

SP, SW P & W Dimensions Smaller than Standard

SB Point Length Longer than Standard



Point Length ▶	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625
Code	Min. P (Rounds)				
37	.092	.092	.092	.124	.157
43	.092	.092	.092	.140	.157
50	.124	.124	.124	.140	.157
62	.234	.234	.234	.234	.234
75	.299	.299	.299	.299	.299
87 or 100	.399	.399	.399	.399	.399

pivot punch corporation

BASIC SERIES

BASIC SERIES CATALOG

All Basic Series items in this section are manufactured to NAPMA standards.

PIVOT BASIC SERIES

HEAD TYPE PUNCHES, DIE BUTTONS AND DIE COMPONENTS

AVAILABLE FROM STOCK . . .

The complete line of basic punches, die buttons and other standard products offered in this catalog are available from stock or custom ground from stock. For your ordering convenience, Pivot maintains a complete inventory to meet your requirements in the shortest possible time.

pivot punch corporation

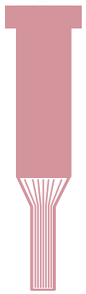
6550 Campbell Blvd. • Lockport, NY 14094
Ph. (716) 625-8000 • Toll-Free Fax. 1-800-622-3227
E-mail. sales@pivotpunch.com

How To Order

H

M2 High Speed Steel
Recommended for a greater variety of industrial uses, including many "hot work" applications, this Molytough, high vanadium, high speed (M-2) tool steel offers uniform hardening quality, superior wear resistance and high impact strength.

Y



Straight Ground Tondra Treated
Grind lines are parallel to the axis and perpendicular to the line of potential fractures. This patented feature, exclusive to Pivot, resists wear, minimizes "pick-up" and achieves maximum strength and punchability. Available in M2 and PM.

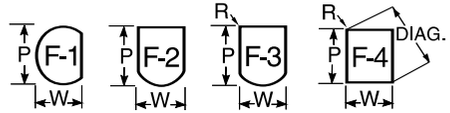
X

Pivot's Whipsleeve Straight Ground Tondra Treated
punches are capable of piercing metal thicknesses which exceed the diameter of the punches. A vibration absorbing inert metal sleeve is cast at the point of the punch where failure normally occurs, thus greatly increasing punch life. When used with a bushing in the stripper it eliminates whipping or shifting and transfers side thrust to the stripper rather than imposing all the force on the working point. Available in M2 and PM.

U

PM3 Ultimate-Extreme Toughness (Impact Strength) and High Wear
No high wear material has ever seen this amount of toughness before. The shock strength approaches that of S-7 Material, with substantial improvements to tool wear life when compared with conventional tool steels such as A-2 and D-2. CPM-3V's high vanadium content offers wear resistance similar to M-2 High Speed Steel.

B Blank
C Round Point
S Square Point
F Flatted Round Point
0 Oblong Point
R Rectangle Point
H Hexagon Form
42 additional Form Shapes Available See p. 56



Standard Form Shapes

TOLERANCES AVAILABLE

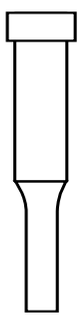
Round points -	+.0005 -.0000	T.I.R.	.0005
Shape points -	±.0005	T.I.R.	.001

"P" Largest Point Dimension
Available in .0001 increments at standard catalog prices.

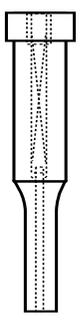
"W" Smallest Point Dimension
Available in .0001 increments at standard catalog prices. Use only where two dimensions are necessary to describe points.

STEEL	PUNCH	SHAPE	BODY DIA.	OVERALL LENGTH	POINT LENGTH	"P"	"W"
H	S	0	37	2.50	C	x .375	x .125

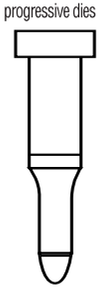
"S"-Shoulder Piercing punches in wide range of styles



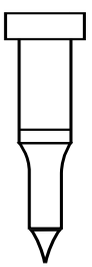
"E"-Ejector Assures positive slug ejection



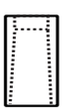
"N"-Parabolic Pilot For extreme accuracy in locating strips from station to station on progressive dies



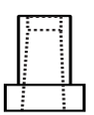
"LN"-Long Nose Pilot For extreme accuracy in locating strips from station to station on progressive dies



"D"-Press Fit Headless Die Buttons, M2 Steel



"H"-Press Fit Head Type Die Buttons, M2 Steel



BODY DIAMETER
Available in 10 fractional body diameters, held to a press fit tolerance of +.0002 +.0005
Press-in lead will be furnished unless otherwise specified.
Order designation first two numbers of decimal equivalent.

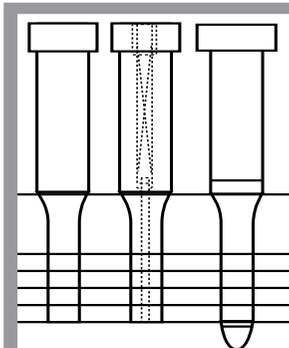
OVERALL LENGTH
A full range to meet most applications.

Order designation:

first numeral- inch increments,

second numeral- quarter inch increments

POINT LENGTH
Five lengths from 7/16" to 1-1/2" to meet most die building requirements.

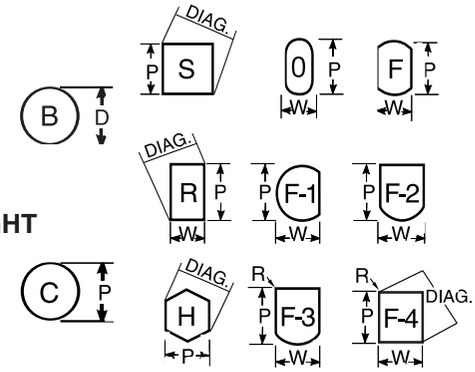


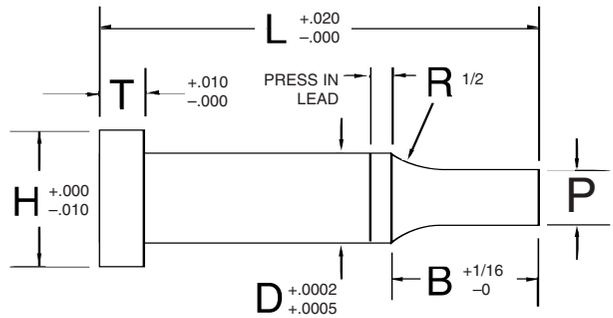
These standard lengths afford the opportunity to select longer point lengths where additional guiding or point life is a factor.

SOLID PUNCHES

STEEL: M2 R/C 60-62
PM3 R/C 58-60
HEADS DRAWN TO R/C 40-55

HS( )
M-2 STEEL
YS( )
M-2 STRAIGHT GRIND
US( )
PM-3





ROUND

+.0005 −.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

UNIVERSAL CODE: 1001 (SEE PAGE 69)

Shank		Head Dim.		Point Length B					Round		Shape		Overall Length L								
				NAPMA	Alternate				Min.	Range	Min.	Min. Max.									
D	Code	H	T	S	B	C	D	E	SP	P	SW	W DIAG.	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
.1875	**18**	.312	.125	.43	.75				.042	.062-.1875	.062	.062-.1875	X	X	X	X	X				
.2500	**25**	.375	.125	.50	.75				.062	.062-.2500	.062	.062-.2500	X	X	X	X	X				
.3125	**31**	.438	.125	.56	.75	1.00*			.062	.093-.3125	.062	.093-.3125	X	X	X	X	X	X	X		
.3750	**37**	.500	.188	.62	.75	1.00	1.25**		.062	.125-.3750	.080	.125-.3750		X	X	X	X	X	X		
.4375	**43**	.562	.188	.62	.75	1.00	1.25		.093	.187-.4375	.080	.187-.4375		X	X	X	X	X	X		
.5000	**50**	.625	.188	.81		1.00	1.25		.125	.187-.5000	.125	.187-.5000			X	X	X	X	X	X	
.6250	**62**	.750	.250	.93			1.25	1.50***	.235	.375-.6250	.235	.250-.6250			X	X	X	X	X	X	
.7500	**75**	.875	.250	1.06			1.25	1.50	.300	.500-.7500	.235	.312-.7500				X	X	X	X	X	X
.8750	**87**	1.000	.250	1.25				1.50	.350	.562-.8750	.235	.343-.8750				X	X	X	X	X	X
1.0000	**100**	1.125	.250	1.25				1.50	.400	.687-1.0000	.235	.375-1.0000					X	X	X	X	X

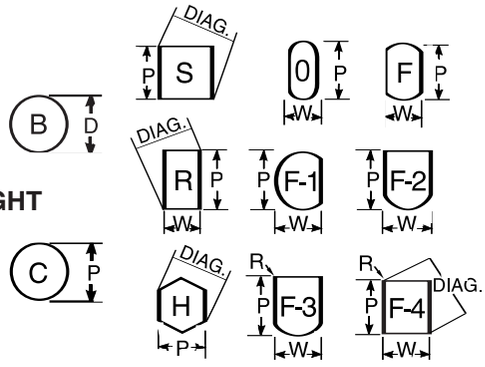
*NOT AVAILABLE ON 1.50 OVERALL LENGTH
**NOT AVAILABLE ON 1.75 OVERALL LENGTH
MIN. SP, SW APPLIES TO S POINT LENGTH
***NOT AVAILABLE ON 2.00 OVERALL LENGTH

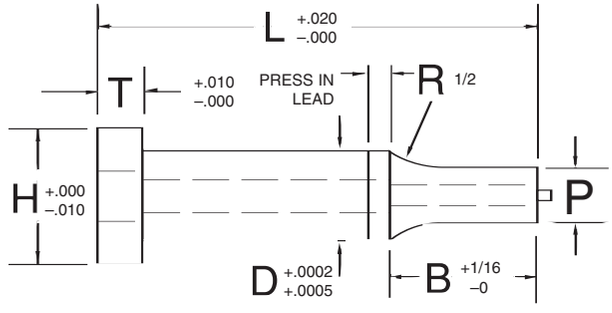
HOW TO ORDER

TYPE	D	L	B	P
HSC	37	2.5	S	.250

EJECTOR PUNCHES

HE( )
M-2 STEEL
YE( )
M-2 STRAIGHT GRIND
UE( )
PM-3





ROUND

+.0005 −.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

UNIVERSAL CODE: 1002 (SEE PAGE 69)

Shank		Head Dim.		Point Length B					Round		Shape		Overall Length L								
				NAPMA	Alternate				Min.	Range	Min.	Min. Max.									
D	Code	H	T	S	B	C	D	E	SP	P	SW	W DIAG.	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
.1875	**18**	.312	.125	.43	.75				.050	.062-.1875	.062	.062-.1875	X	X	X	X	X				
.2500	**25**	.375	.125	.50	.75				.080	.093-.2500	.080	.093-.2500	X	X	X	X	X				
.3125	**31**	.438	.125	.56	.75	1.00*			.115	.125-.3125	.115	.125-.3125	X	X	X	X	X	X	X		
.3750	**37**	.500	.188	.62	.75	1.00			.158	.187-.3750	.158	.187-.3750		X	X	X	X	X	X		
.4375	**43**	.562	.188	.62	.75	1.00	1.25		.158	.187-.4375	.158	.187-.4375		X	X	X	X	X	X		
.5000	**50**	.625	.188	.81		1.00			.158	.250-.5000	.158	.187-.5000			X	X	X	X	X	X	
.6250	**62**	.750	.250	.93			1.25		.235	.375-.6250	.235	.250-.6250			X	X	X	X	X	X	
.7500	**75**	.875	.250	1.06			1.25		.300	.500-.7500	.235	.312-.7500				X	X	X	X	X	X
.8750	**87**	1.000	.250	1.25				1.50	.350	.562-.8750	.235	.343-.8750				X	X	X	X	X	X
1.0000	**100**	1.125	.250	1.25				1.50	.400	.687-1.0000	.235	.375-1.0000					X	X	X	X	X

*NOT AVAILABLE ON 1.50 OVERALL LENGTH
MIN. SP, SW APPLIES TO S POINT LENGTH

HOW TO ORDER

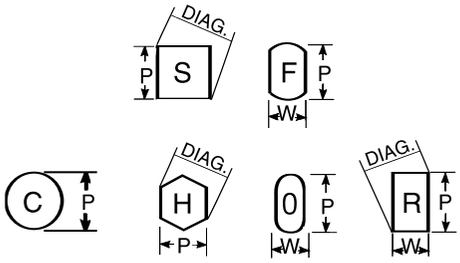
TYPE	D	L	B	P
HEC	50	3	C	.375

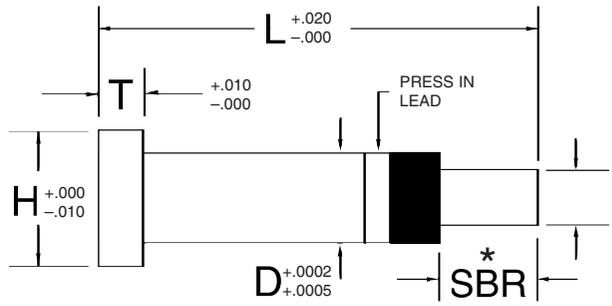
STEEL: M2 R/C 60-62
HEADS DRAWN TO R/C 40-55

WHIPSLEEVE SOLID PUNCHES

XS( )

M-2 STEEL





*ROUND. SQUARE, HEXAGON PT. - SBR=3xP or MAX.
*FLATTED ROUND, OBLONG, RECTANGLE PT. - SBR=3xW or MAX.

ROUND

+.0005 –.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

Shank		Head Dim.		Round		Shape		Overall Length L							
D	Code	H	T	Max. SBR	Range P	Min. W	Max. DIAG.	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
.1875	**18**	.312	.125	.31	.060-.109	.060-.109		X	X	X	X				
.2500	**25**	.375	.125	.37	.060-.125	.060-.125		X	X	X	X				
.3125	**31**	.438	.125	.50	.062-.172	.060-.172		X	X	X	X	X	X		
.3750	**37**	.500	.188	.56	.093-.218	.093-.218		X	X	X	X	X	X		
.5000	**50**	.625	.188	.62	.125-.297	.125-.297			X	X	X	X	X	X	
.6250	**62**	.750	.250	.62	.203-.375	.203-.375			X	X	X	X	X	X	
.7500	**75**	.875	.250	.75	.281-.500	.281-.500				X	X	X	X	X	X
1.0000	**100**	1.125	.250	.87	.468-.687	.437-.687					X	X	X	X	X

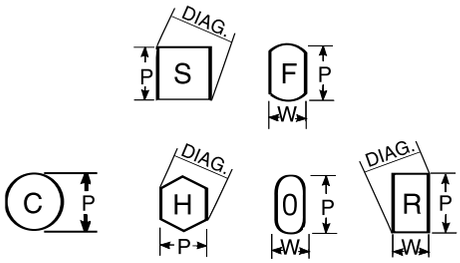
HOW TO ORDER

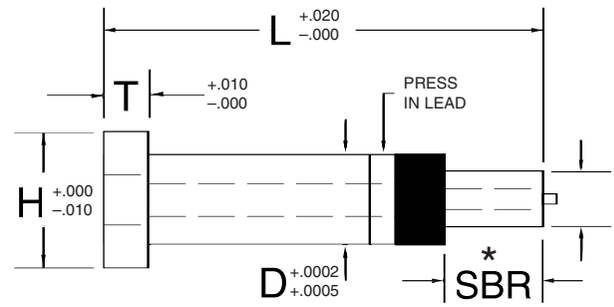
TYPE	D	L	P
XSC	37	2.25	.187

WHIPSLEEVE EJECTOR PUNCHES

XE( )

M-2 STEEL





*ROUND. SQUARE, HEXAGON PT. - SBR=3xP or MAX.
*FLATTED ROUND, OBLONG, RECTANGLE PT. - SBR=3xW or MAX.

ROUND

+.0005 –.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

Shank		Head Dim.		Round		Shape		Overall Length L							
D	Code	H	T	Max. SBR	Range P	Min. W	Max. DIAG.	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
.1875	**18**	.312	.125	.31	.060-.109	.060-.109		X	X	X	X				
.2500	**25**	.375	.125	.37	.060-.125	.060-.125		X	X	X	X				
.3125	**31**	.438	.125	.50	.062-.172	.060-.172		X	X	X	X	X	X		
.3750	**37**	.500	.188	.56	.093-.218	.093-.218		X	X	X	X	X	X		
.5000	**50**	.625	.188	.62	.125-.297	.125-.297			X	X	X	X	X	X	
.6250	**62**	.750	.250	.62	.203-.375	.203-.375			X	X	X	X	X	X	
.7500	**75**	.875	.250	.75	.281-.500	.281-.500				X	X	X	X	X	X
1.0000	**100**	1.125	.250	.87	.468-.687	.437-.687					X	X	X	X	X

HOW TO ORDER

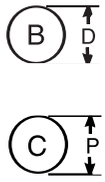
TYPE	D	L	P
XEC	50	2.5	.250

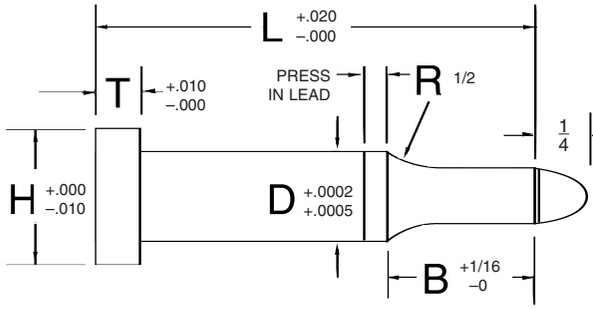
REGULAR PILOTS

STEEL: M2 R/C 60-62
HEADS DRAWN TO: R/C 40-55

HN( )

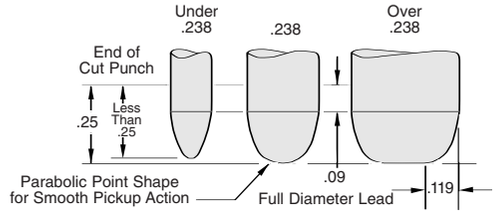
M-2 STEEL





ROUND

+.0005 –.0000
T • I • R .0005



UNIVERSAL CODE: 100109 (SEE PAGE 69)

Shank		Head Dim.		Point Length B					Round		Length L								
				NAPMA	Alternate				Min.	Range									
D	Code	H	T	S	B	C	D	E	SP	P	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
.1875	**18**	.312	.125	.43	.75				.041	.061-.1875	X	X	X	X	X				
.2500	**25**	.375	.125	.50	.75				.061	.092-.2500	X	X	X	X	X				
.3125	**31**	.438	.125	.56	.75	1.00*			.061	.092-.3125	X	X	X	X	X	X	X		
.3750	**37**	.500	.188	.62	.75	1.00	1.25**		.061	.124-.3750		X	X	X	X	X	X		
.4375	**43**	.562	.188	.625	.75	1.00	1.25		.092	.187-.4375		X	X	X	X	X	X		
.5000	**50**	.625	.188	.81		1.00	1.25		.124	.186-.5000			X	X	X	X	X	X	
.6250	**62**	.750	.250	.93			1.25	1.50***	.234	.374-.6250			X	X	X	X	X	X	
.7500	**75**	.875	.250	1.06			1.25	1.50	.299	.499-.7500				X	X	X	X	X	X
.875	**87**	1.000	.250	1.25				1.50	.349	.561-.8750					X	X	X	X	X
1.0000	**100**	1.125	.250	1.25				1.50	.399	.686-1.0000					X	X	X	X	X

*NOT AVAILABLE ON 1.50 OVERALL LENGTH
**NOT AVAILABLE ON 1.75 OVERALL LENGTH
***NOT AVAILABLE ON 2.00 OVERALL LENGTH

MIN. SP APPLIES TO S POINT LENGTH

HOW TO ORDER

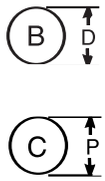
TYPE	D	L	B	P
HNC	37	3	C	.250

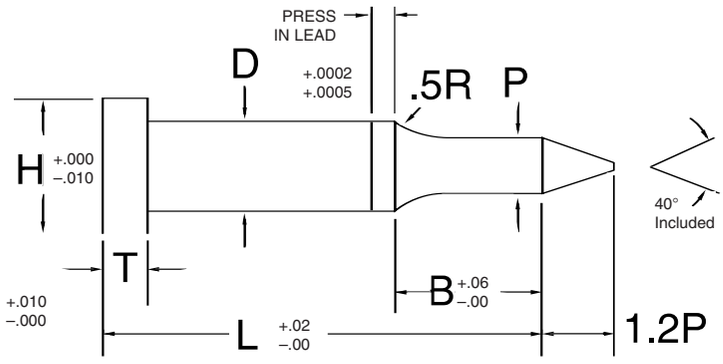
LONG NOSE PILOT

STEEL: M2 R/C 60-62
HEADS DRAWN TO: R/C 40-55

HLN( )

M-2 STEEL

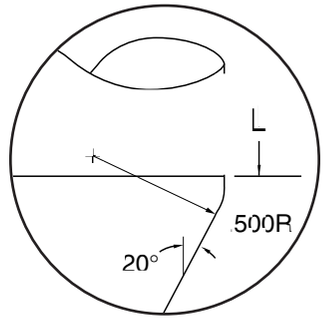




UNDER .186 SP PILOT NOSE IS 1.5P

ROUND

+.0005 –.0000
T • I • R .0005



UNIVERSAL CODE: 100108 (SEE PAGE 69)

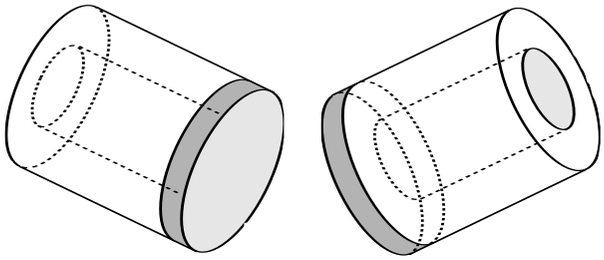
Shank		Head Dim.		Round			Length L												
				Std.	Min.	Range													
D	Code	H	T	B	SP	P	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50
.3750	**37**	.500	.188	.62	.092	.186-.375	X	X	X	X	X	X	X						
.4375	**43**	.562	.188	.625	.092	.186-.4375	X	X	X	X	X	X	X	X	X	X	X	X	X
.5000	**50**	.625	.188	.81	.124	.249-.500	X	X	X	X	X	X	X	X	X	X	X	X	X
.6250	**62**	.750	.250	.94	.234	.311-.625	X	X	X	X	X	X	X	X	X	X	X	X	X
.7500	**75**	.875	.250	1.06	.299	.436-.750	X	X	X	X	X	X	X	X	X	X	X	X	X
.8750	**87**	1.00	.250	1.25	.399	.561-.875			X	X	X	X	X	X	X	X	X	X	X
1.0000	**100**	1.125	.250	1.25	.399	.749-1.000			X	X	X	X	X	X	X	X	X	X	X

*UNDER .186 PILOT NOSE IS 1.5P.

HOW TO ORDER

TYPE	D	L	P
HLNC	50	4	.375

NOMAR URAFLEX® NYLON STRIPPERS

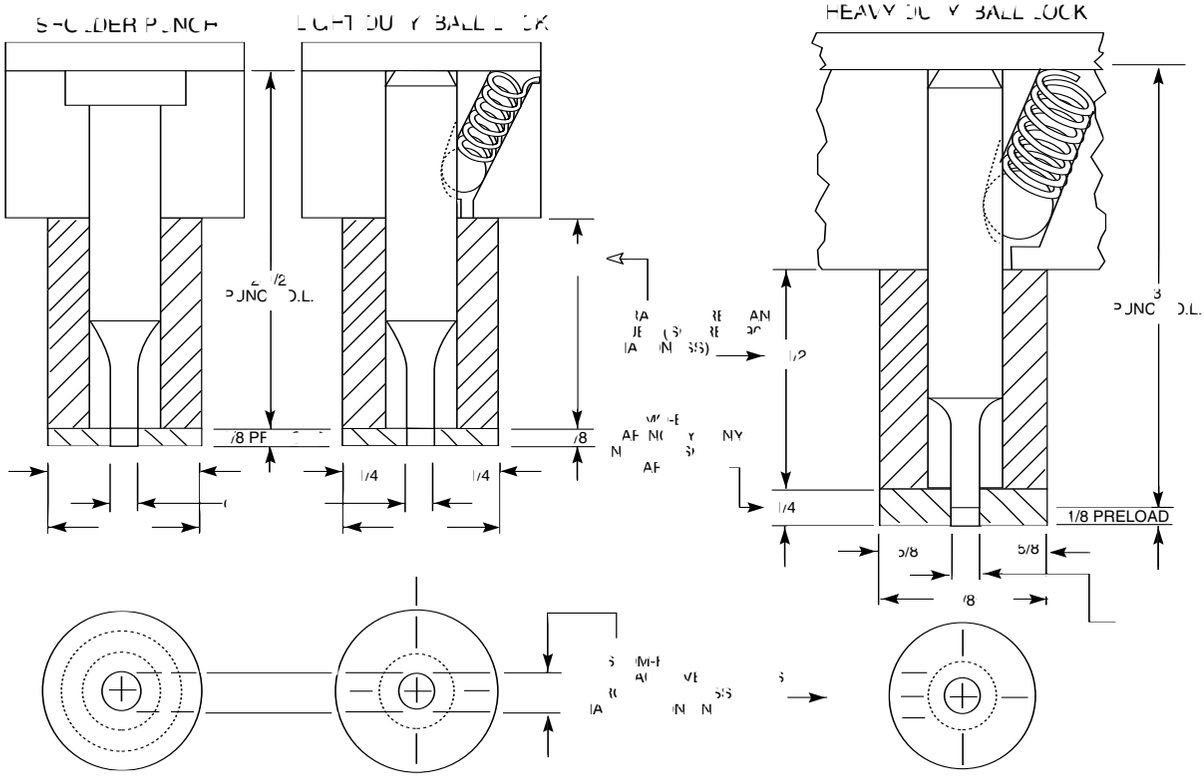


TOUGH – DURABLE thermo-bonding of the hard nylon end cap to the Uraflex® tube results in a closed-end stripper with maximum bond strength, impact resistance and load-bearing capacity with minimum expansion (only 1/16" O.D. for 1/8" deflection). "Nomar"™ Strippers are resistant to oil, grease, and most metal-working chemicals and will withstand extremely high stripping pressures. The hard nylon end cap assures better guidance in its "custom fitted" guide hole and resists metal pick-up or abrasion over long periods of use.

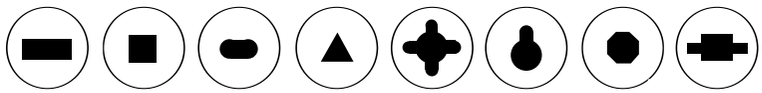
RESILIENT, NON-COMPRESSING Under pressure, Uraflex® tubes flow and displace, dampening the shock. When the pressure is released the "Miracle" Uraflex®", with its excellent memory qualities, returns to its original shape. This excellent resilience without brittleness provides for extensive and constantly repetitive deformation without deterioration and offers many times the wear life of rubber strippers.

EASY TO INSTALL - PRACTICAL Just push the "Nomar"™ Stripper over any cylindrically ground, straight-ground of whipsleeved shoulder or ball lock punch. The first stroke of the press (without material shock) pierces a custom-fitted guide hole in the hard nylon end cap. The end cap provides a 1/8" preload when used with standard ball lock punches and retainers. "Nomar"™ Strippers prevent marring, denting, scratching or gouging painted, galvanized or soft metal surfaces and are available in a wide selection of sizes.

TYPICAL APPLICATIONS - 1/2" SHANK DIAMETER PUNCHES



***"NOMAR"*™ Strippers provide guide holes for any punch shape**



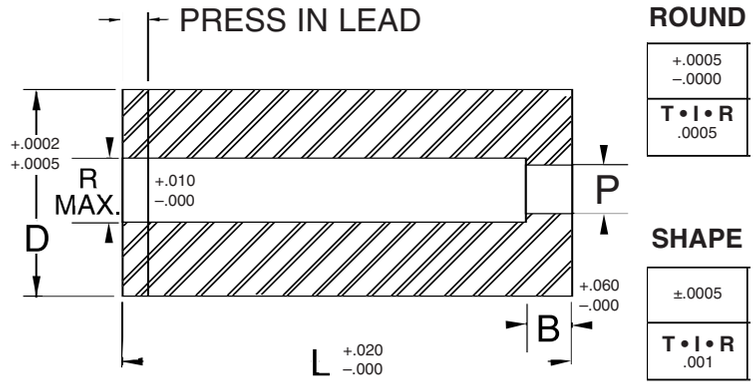
HOW TO ORDER

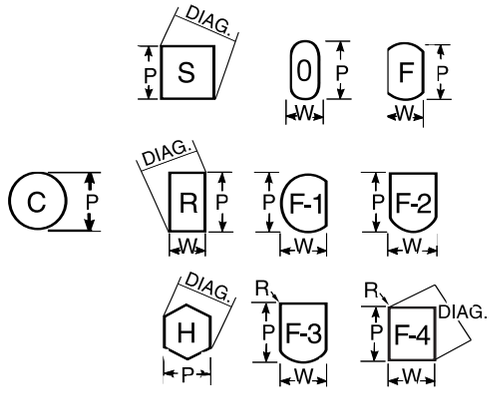
Catalog Number		Catalog Number
LN62-1-7/8	OR	**HN62-1-3/4**
Light Duty		Heavy Duty

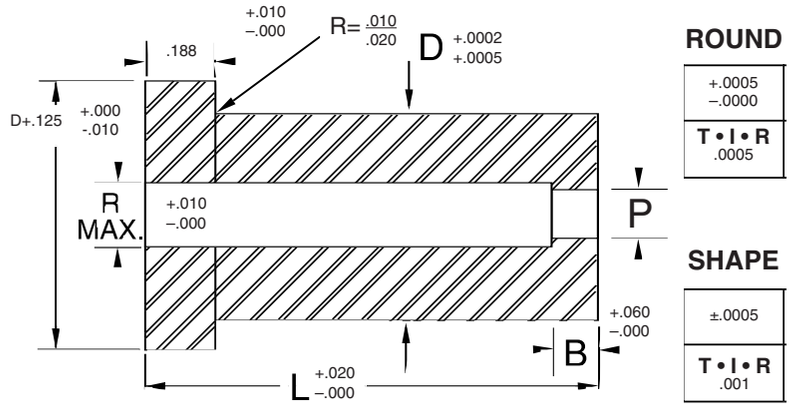
DIE BUTTONS HEADLESS/HEADED

HD( )
HEADLESS M-2

HH( )
HEADED M-2







UNIVERSAL CODE: 1041 & 1042 (SEE PAGE 69)

Shank				Round	Shape		Overall Length L							
D	Code	Min. B	Max. R	Range P	Min. W	Max. DIAG.	3/4	7/8	15/16**	1	1 1/8	1 1/4	1 3/8	1 1/2
.2500	**2**	.156	.156	.064-.125	-	-	X	X	X	X	X	X	X	
.3750	**3**	.156	.228	.064-.195	.048-	.195	X	X	X	X	X	X	X	X
.5000	**4**	.156	.312	.064-.285	.064-	.285	X	X	X	X	X	X	X	X
.6250	**5**	.187	.391	.136-.365	.095-	.365	X	X	X	X	X	X	X	X
.7500	**6**	.187	.468	.136-.435	.118-	.435	X	X	X	X	X	X	X	X
.8750	**7**	.187	.578	.276-.545	.127-	.545	X	X	X	X	X	X	X	X
1.0000	**8**	.250	.687	.356-.675	.158-	.655	X	X	X	X	X	X	X	X
1.2500	**9**	.250	.812	.500-.800	.189-	.780	X	X	X	X	X	X	X	X
1.5000	**10**	.250	1.062	.616-1.050	.252-	1.035	X	X	X	X	X	X	X	X

**HEADLESS ONLY

HOW TO ORDER

TYPE	D	L	P
HDC	4	1.0	.187

WIRE & CONVENTIONAL EDM DIE BUTTONS

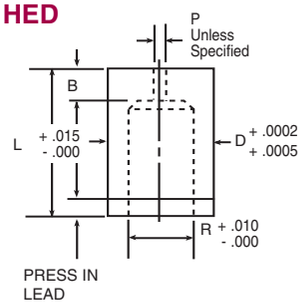
HED

HEH

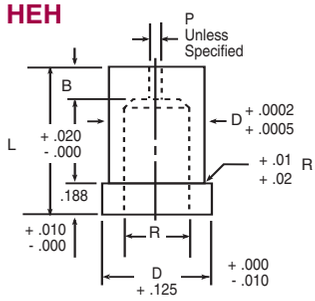
HUD

HUH

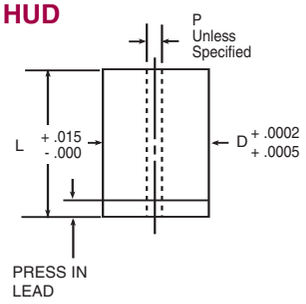
HED



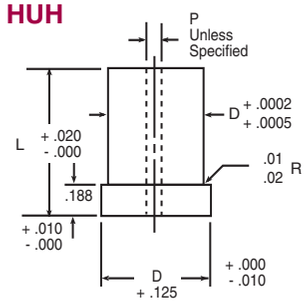
HEH



HUD



HUH



Round P ± .005

◎	.005	P to D

UNIVERSAL CODE: 104111 & 104211 (SEE PAGE 69)

Body		HUD/HUH	HED/HEH			Overall Length L							
D	Code	P	P	Max. B	R	3/4	7/8	15/16**	1	1 1/8	1 1/4	1 3/8	1 1/2
.2500	**2**	.031	-	-	-	X	X	X	X	X	X	X	
.3750	**3**	.031	.032	.25	.228	X	X	X	X	X	X	X	X
.5000	**4**	.062	.032	.25	.312	X	X	X	X	X	X	X	X
.6250	**5**	.062	.093	.25	.391	X	X	X	X	X	X	X	X
.7500	**6**	.062	.093	.31	.468	X	X	X	X	X	X	X	X
.8750	**7**	.062	.093	.31	.578	X	X	X	X	X	X	X	X
1.0000	**8**	.062	.093	.31	.703	X	X	X	X	X	X	X	X
1.2500	**9**	.062	.125	.37	.828	X	X	X	X	X	X	X	X
1.5000	**10**	.062	.125	.37	1.094	X	X	X	X	X	X	X	X

**HEADLESS ONLY

HOW TO ORDER

TYPE	D	L
HUD	4	1

HUD
HUH

These blanks are provided with small straight through hole. They are commonly used for wire and vertical EDM operations. There are basically two advantages to this type of blank:
1. In wire cutting, a taper relief can be cut instead of a round straight relief.
2. In conventional EDM applications you can “tailor” the size of the relief to the shape you are cutting.

HED
HEH

These blanks are used with conventional type EDM machines. The “P” hole is used for flushing away particles of steel. Relief hole (R) provides clearance for slug removal.

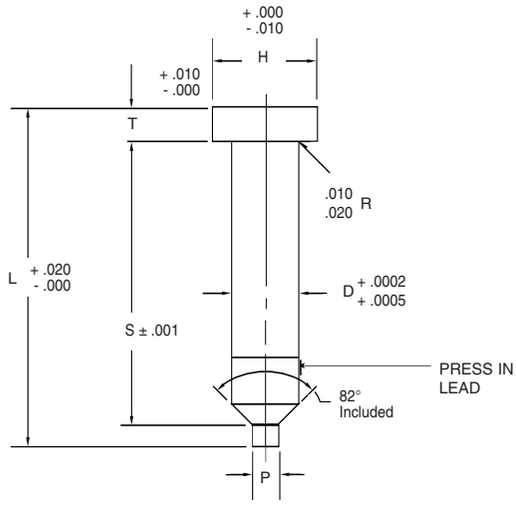
HSK

M-2 HSS

Precision Countersink Punches have an accurate (± .001") length from under the head to the bottom of the countersink for precise timing of the die.

ROUND

+.0005 –.0000
T • I • R .0005



NOTE:
"S" LENGTH UNDER HEAD TO BOTTOM ANGLE.

UNIVERSAL CODE: 1041 & 1042 (SEE PAGE 69)

Shank		Head Dim.			Range	Overall Length L								
D	Code	H	T	S	P	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4
.2500	**25**	.375	.125	Specify in .001" increments	.050-.125	X	X	X	X	X				
.3125	**31**	.438	.125		.076-.140	X	X	X	X	X	X			
.3750	**37**	.500	.188		.090-.187		X	X	X	X	X	X		
.5000	**50**	.625	.188		.141-.250			X	X	X	X	X	X	
.6250	**62**	.750	.250		.200-.281			X	X	X	X	X	X	
.7500	**75**	.875	.250		.264-.359				X	X	X	X	X	X
1.0000	**100**	1.125	.250		.374-.500					X	X	X	X	X

HOW TO ORDER

TYPE	D	L	P	S
HSK	37	3	.125	2.400

PERFORATORS

P
M-2 Steel Cylindrically Ground

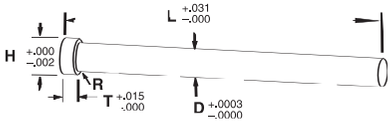
YP
M-2 Steel Straight Ground

PN
M-2 Steel Pilot Nose

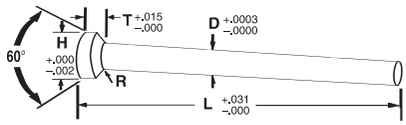
OVERALL LENGTH SHOWN
INCLUDES PILOT NOSE

SPECIFY STYLE "A" OR "B"
"B" FURNISHED IF NOT SPECIFIED

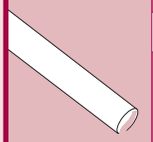
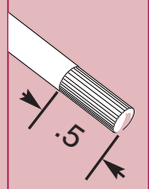
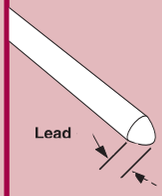
STYLE B
(Button Head)



STYLE A
(Angle Head)



R/C 60-62
HEADS DRAWN TO R/C 40-55

DIMENSIONS				OVERALL LENGTHS AVAILABLE (L)							Cylindrically Ground	Straight Ground	Pilot Nose	
	BODY DIAMETER	HEAD		Any length shown (X) in each given body diameter and within point range shown "one price" **Minimum Lengths P - YP - PN**							 ORDER **P**	 ORDER **YP**	 ORDER **PN**	
CODE NO.	D .001 Increments	THICKNESS T	DIAMETER H	2	$2^1/_4$	$2^1/_2$	$2^3/_4$	3	$3^1/_2$	4	CAT. NO.	CAT. NO.	CAT. NO.	LEAD
1	.030-.040	3/32	.070		X						P-1	YP-1	PN-1	3/32
2	.041-.055	3/32	.085			X					P-2	YP-2	PN-2	3/32
* 3	.056-.070	3/32	.100				X				P-3	YP-3	PN-3	3/32
4	.071-.085	3/32	.115				X				P-4	YP-4	PN-4	3/32
* 5	.086-.100	3/32	.130					X			P-5	YP-5	PN-5	5/32
6	.101-.115	3/32	.145					X			P-6	YP-6	PN-6	5/32
7	.116-.130	3/32	.160					X			P-7	YP-7	PN-7	5/32
8	.131-.145	3/32	.175					X			P-8	YP-8	PN-8	5/32
* 9	.146-.160	3/32	.190					X			P-9	YP-9	PN-9	5/32
10	.161-.175	1/8	.205					X			P-10	YP-10	PN-10	5/32
* 11	.176-.190	1/8	.220					X			P-11	YP-11	PN-11	7/32
12	.191-.205	1/8	.235					X			P-12	YP-12	PN-12	7/32
* 13	.206-.220	1/8	.250					X			P-13	YP-13	PN-13	7/32
14	.221-.235	1/8	.265					X			P-14	YP-14	PN-14	7/32
15	.236-.250	1/8	.280					X			P-15	YP-15	PN-15	7/32
16	.251-.265	1/8	.295						X		P-16	YP-16	PN-16	9/32
17	.266-.280	1/8	.310						X		P-17	YP-17	PN-17	9/32
* 18	.281-.295	1/8	.325						X		P-18	YP-18	PN-18	9/32
19	.296-310	1/8	.340						X		P-19	YP-19	PN-19	9/32
* 20	.311-.312	3/16	.355						X		P-20	YP-20	PN-20	9/32
21	.313-.325	3/16	.355						X		P-21	YP-21	PN-21	9/32
22	.326-.340	3/16	.370							X	P-22	YP-22	PN-22	9/32
* 23	.341-.355	3/16	.385							X	P-23	YP-23	PN-23	9/32
24	.356-.370	3/16	.400							X	P-24	YP-24	PN-24	9/32
25	.371-.385	3/16	.415							X	P-25	YP-25	PN-25	9/32

* Fractional sizes of 1/16 - 3/32 - 5/32 -3/16 - 7/32 - 9/32 - 11/32 available at no extra charge.

UNIVERSAL CODE: 1106 (SEE PAGE 69)

HOW TO ORDER

	Cat. No.		Overall Length	"D"		Style
Cyl. Grd. -	**P-12**	**x**	**2**	**x**	**.197**	**Style (A)**
Pilot Nose -	**PN-12**	**x**	**2-1/4**	**x**	**.197**	**Style (A)**

STANDARD ALTERATIONS

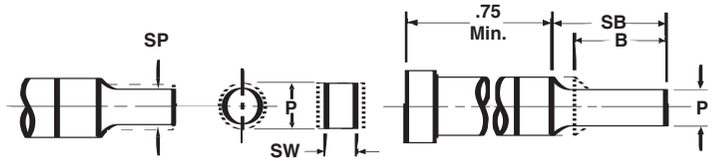
Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

Ejector & Solid

HS( ) YS( ) HE( ) YE( )

SP, SW **P & W Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**



Point Length ▶	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625
Code	Min. P (Rounds)					Min. W (Shapes)				
18	.050 .042	.058 .058	 .075	 .093		.062 .062	.093 .062	 .093	 .125	
25	.080 .062	.080 .062	.080 .080	 .093		.080 .062	.093 .062	.093. .093	 .125	
31	.115 .062	.115 .062	.115 .093	.115 .093	.125 .125	.115 .062	.115 .093	.125 .093	.172 .125	.195 .195
37	.158 .062	.158 .062	.158 .093	.158 .125	.158 .125	.158 .080	.158 .109	.158 .125	.172 .125	.195 .195
50		.158 .125	.158 .125	.158 .125	.158 .125		.158 .125	.158 .141	.172 .172	.195 .195
62		.235 .235	.235 .235	.235 .235	.235 .235		.235 .235	.235 .235	.235 .235	.235 .235
75		.300 .300	.300 .300	.300 .300	.300 .300		.235 .235	.235 .235	.235 .235	.235 .235
87 or 100		.400 .400	.400 .400	.400 .400	.400 .400		.235 .235	.235 .235	.235 .235	.235 .235

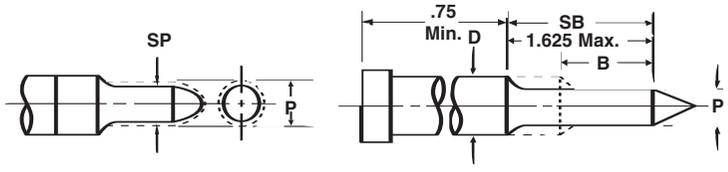
Alterations shown on this page apply equally to both Positive Pick-Up and regular pilots.

Pilots & Long Nose Pilots

HN( ) HLN( )

SP, SW **P & W Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**



Point Length ▶	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625
Code	Min. P (Rounds)				
18	.050	.057	.074	.092	
25	.061	.061	.079	.092	
31	.061	.061	.092	.092	.124
37	.061	.061	.092	.124	.124
50	.124	.124	.124	.124	.124
62	.234	.234	.234	.234	.234
75	.299	.299	.299	.299	.299
87 or 100	.399	.399	.399	.399	.399

Point Length ▶	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625
Code	Min. P (Rounds)				
37	.092	.092	.092	.124	.157
50	.124	.124	.124	.140	.157
62	.234	.234	.234	.234	.234
75	.299	.299	.299	.299	.299
87 or 100	.399	.399	.399	.399	.399

pivot punch corporation

BALL LOCK

BALL LOCK CATALOG

All Ball Lock Basic Series items in this section are manufactured to NAPMA standards.

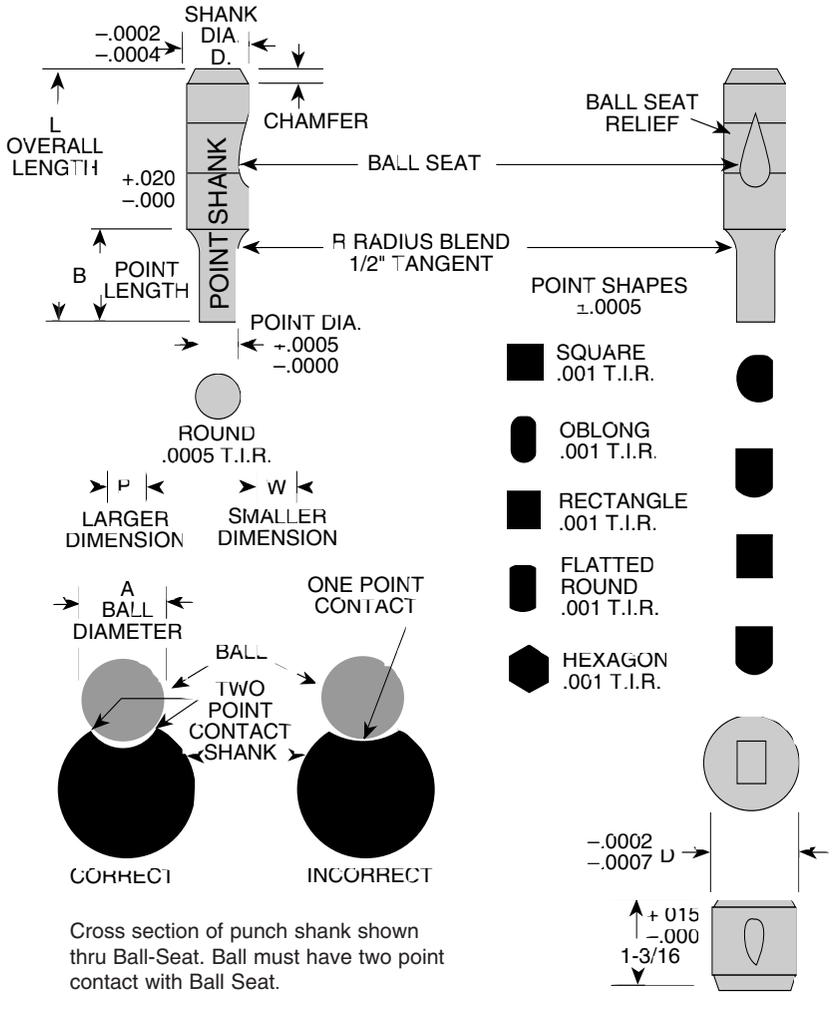
ball lock information

All A.N.S.I. standard basic ball lock, light and heavy duty punches, die buttons and retainers are included in this catalog. Light-Duty Interchangeable Punches are standard in Round, Oblong, Square, Rectangular, Flatted Round and Hexagon shapes with punches available in 1/4" to 1" O.D. Shank sizes. Size of the Locking Ball in the retainer ranges from 1/4" diameter to 3/8" diameter. The Light-Duty series will pierce up to 1/8" stock.

Heavy-Duty Interchangeable Punches are standard in Round, Oblong, Square, Rectangular, Flatted Round, and Hexagon shapes with punches available in 3/8" to 1-1/4" O.D. Shank sizes. Size of the Locking Ball in the retainer is 1/2" diameter. The Heavy-Duty series generally will pierce up to 3/8" stock in all but a few of the larger sizes.

STANDARD LOCATIONS
NINE BASIC SHAPES

To insure proper locking of the Ball Lock, insert the punch or die button with the Ball Seat at approximately 90° to the Ball and then twist the punch or button until an audible click is heard.



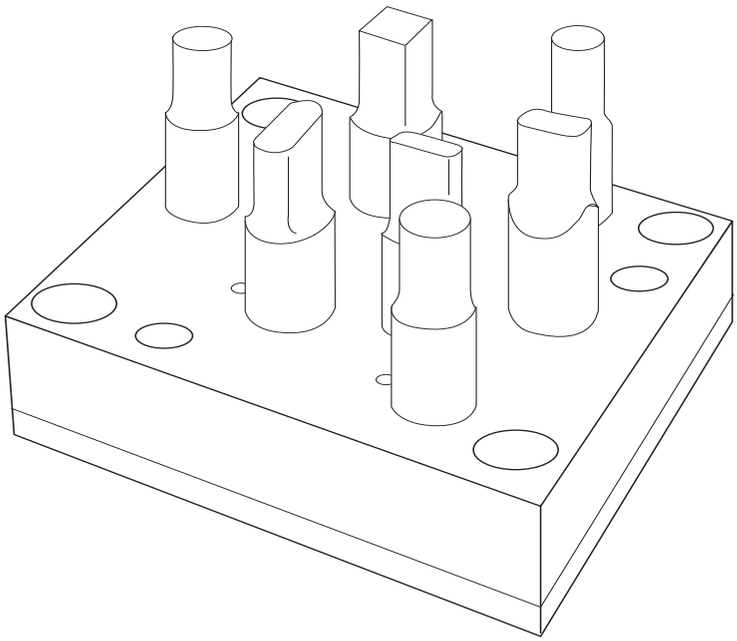
Cross section of punch shank shown thru Ball-Seat. Ball must have two point contact with Ball Seat.

LIGHT DUTY PUNCH	
D SHANK DIAMETER	A BALL DIAMETER
1/4	1/4
3/8	1/4
1/2	5/16
5/8	5/16
3/4	3/8
7/8	3/8
1	3/8

HEAVY DUTY PUNCH	
D SHANK DIAMETER	A BALL DIAMETER
3/8	3/8
1/2	1/2
5/8	1/2
3/4	1/2
7/8	1/2
1	1/2
1-1/4	1/2

DIE BUTTON	
D O.D. OF BUTTON	A BALL DIAMETER
1/2	5/16
5/8	5/16
3/4	3/8
7/8	3/8
1	3/8
1-1/4	3/8
1-1/2	3/8
1-3/4	3/8

special retainers

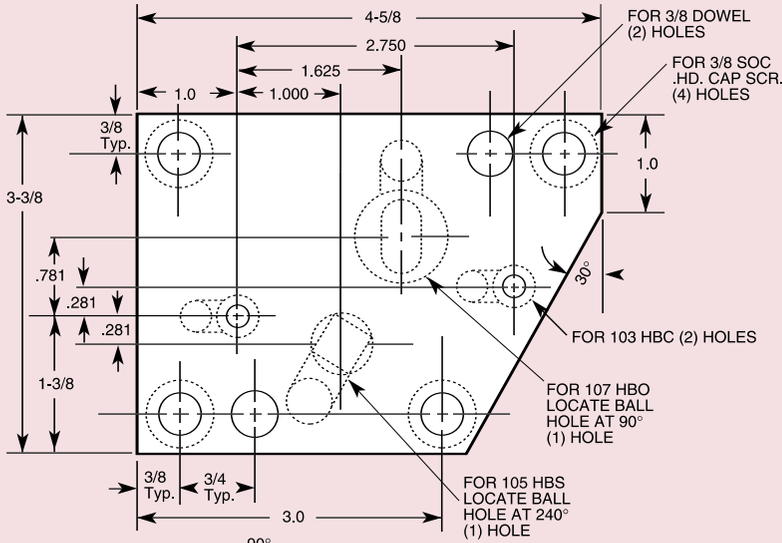


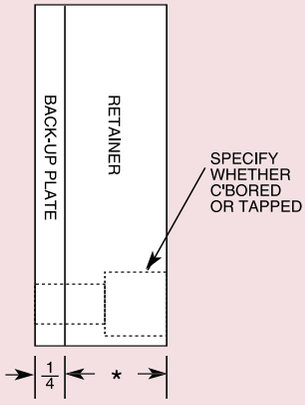
If close hole spacing prevents your use of standard retainers, Pivot Punch will make Special Retainers to your specifications. Pivot Punch will also furnish Special Die Button Retainers either in Ball Lock or Press Fit Type. Send drawings for quotations or recommendations without obligation.

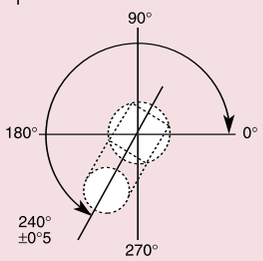
The drawing below is intended as a reference only and not to limit size, shape or tolerance. Screw and dowel locations are fractional. Specify if closer tolerances are required. Pierce Points should be shown in Phantom to avoid errors.

- *PROMPT SERVICE*
- *PROMPT DELIVERY*

standard retainers available see pg. 50 & 51







FOR GROUND BALL HOLE LOCATIONS READ DEGREE COUNTER CLOCKWISE FROM 0°

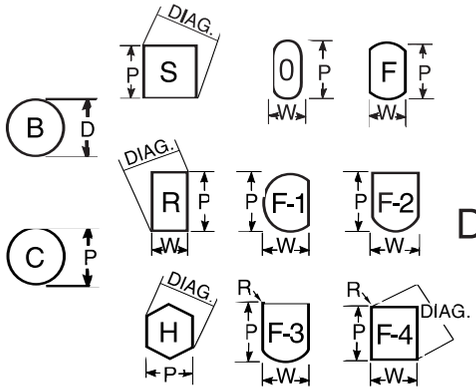
HOLE TYPE	TYPE FINISH	STD. TOLERANCES	
		DIA.	LOCATION
Screw	Machine	+1/32	±.005
Dowel	Ground	+.0002 −.0000	±.0002
Punch	Ground	+.0003 −.0000	±.0002
Ball Hall Round point	Machine	—	—
Ball Hole Shaped Point	Ground	—	±0°5'

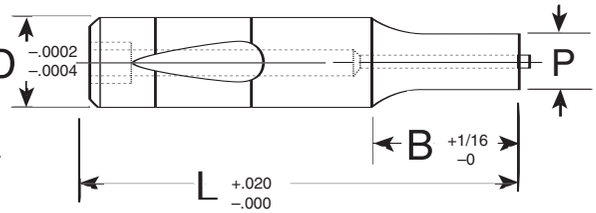
EJECTOR PUNCH / HEAVY DUTY

HE( )
M-2

YE( )
M-2 STRAIGHT GRIND

UE( )
PM-3





ROUND

+.0005 −.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

UNIVERSAL CODE: 1302 (SEE PAGE 67)

** NOTE ON BLANKS NOMINAL SIZE −.0002 −.0004

Shank		Point Length B				Round		Shape		Overall Length L									
		NAPMA	Alternate			Min.	Range	Min.	Min. Max.	*									
D	Code	S	B	C	D	SP	P **	SW	W DIAG.	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	5.00
.375	113	.625	.75	1.00		.062	.125-.375	.062	.125-.374	X	X	X	X	X	X	X			
.500	114	.812	.75	1.00	1.25	.158	.187-.500	.158	.187-.499	X	X	X	X	X	X	X	X	X	X
.625	115	.937	.75	1.00	1.25	.158	.312-.625	.158	.250-.624	X	X	X	X	X	X	X	X	X	X
.750	116	1.062	.75	1.00	1.25	.235	.437-.750	.235	.312-.749	X	X	X	X	X	X	X	X	X	X
.875	117	1.187	.75	1.00	1.25	.300	.625-.875	.235	.375-.874		X	X	X	X	X	X	X	X	X
1.000	118	1.250	.75	1.00	1.25	.350	.750-1.000	.235	.437-.999			X	X	X	X	X	X	X	X
1.250	119	1.437	.75	1.00	1.25	.450	1.000-1.250	.235	.500-1.249			X	X	X	X	X	X	X	X

* NOT AVAILABLE IN “D” POINT LENGTH

HOW TO ORDER

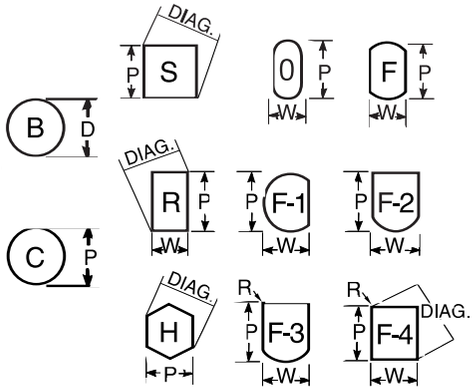
TYPE	D	L	B	P
HEC	114	3.5	C	.250

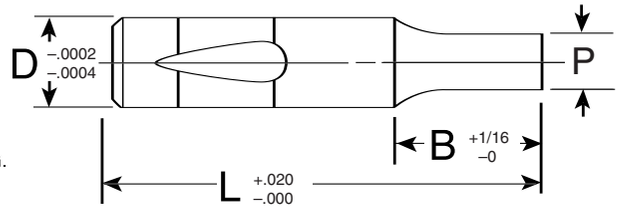
SOLID PUNCH / HEAVY DUTY

HB( )
M-2

YB( )
M-2 STRAIGHT GRIND

UB( )
PM-3





ROUND

+.0005 −.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

UNIVERSAL CODE: 1302 (SEE PAGE 67)

** NOTE ON BLANKS NOMINAL SIZE −.0002 −.0004

Shank		Point Length B				Round		Shape		Overall Length L									
		NAPMA	Alternate			Min.	Range	Min.	Min. Max.	*									
D	Code	S	B	C	D	SP	P **	SW	W DIAG.	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	5.00
.375	113	.625	.75	1.00		.062	.125-.375	.062	.125-.374	X	X	X	X	X	X	X			
.500	114	.812	.75	1.00	1.25	.158	.187-.500	.158	.187-.499	X	X	X	X	X	X	X	X	X	X
.625	115	.937	.75	1.00	1.25	.158	.312-.625	.158	.250-.624	X	X	X	X	X	X	X	X	X	X
.750	116	1.062	.75	1.00	1.25	.235	.437-.750	.235	.312-.749	X	X	X	X	X	X	X	X	X	X
.875	117	1.187	.75	1.00	1.25	.300	.625-.875	.235	.375-.874		X	X	X	X	X	X	X	X	X
1.000	118	1.250	.75	1.00	1.25	.350	.750-1.000	.235	.437-.999			X	X	X	X	X	X	X	X
1.250	119	1.437	.75	1.00	1.25	.450	1.000-1.250	.235	.500-1.249			X	X	X	X	X	X	X	X

* NOT AVAILABLE IN “D” POINT LENGTH

HOW TO ORDER

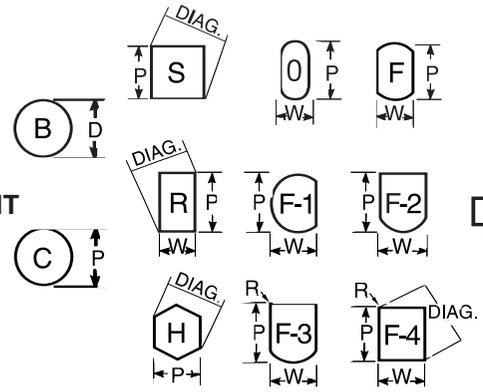
TYPE	D	L	B	P
HBC	115	4	C	.500

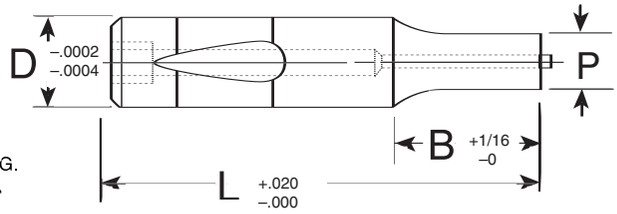
STEEL: M2 R/C 60-62

EJECTOR PUNCH / LIGHT DUTY

HE( )
M-2 STEEL

YE( )
M-2 STRAIGHT GRIND





ROUND

+.0005 −.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

** NOTE ON BLANKS NOMINAL SIZE −.0002 −.0004

UNIVERSAL CODE: 1202 (SEE PAGE 67)

Shank		Point Length B			Round		Shape		Overall Length L								
		NAPMA	Alternate		Min.	Range	Min.	Min. Max.									
D	Code	S	B	C	SP	P**	SW	W DIAG.	*2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
.250	102	.500	.750		.050	.062-.250	.050	.062-.249	X	X	X	X	X	X	X		
.375	103	.625	.750	1.00	.115	.125-.375	.115	.125-.374	X	X	X	X	X	X	X	X	X
.500	104	.750	.750	1.00	.158	.187-.500	.158	.187-.499	X	X	X	X	X	X	X	X	X
.625	105	.875	.750	1.00	.158	.312-.625		.250-.624	.158	X	X	X	X	X	X	X	X
.750	106	.937	.750	1.00	.235	.437-.750		.312-.749	.235	X	X	X	X	X	X	X	X
.875	107	.937	.750	1.00	.300	.625-.875		.375-.874	.235	X	X	X	X	X	X	X	X
1.000	108	.937	.750	1.00	.350	.750-1.000		.437-.999	.235	X	X	X	X	X	X	X	X

*AVAILABLE IN “S” POINT LENGTH ONLY

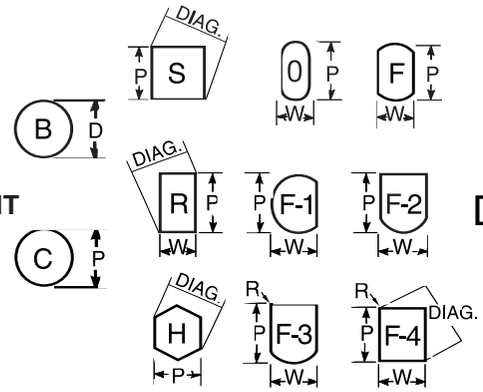
HOW TO ORDER

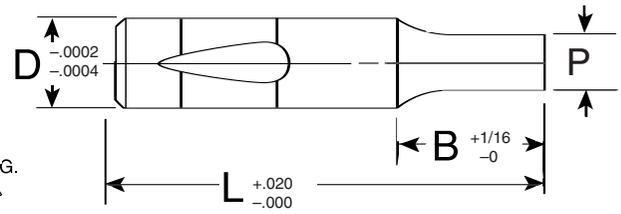
TYPE	D	L	B	P
HEC	104	3	S	.200

SOLID PUNCH / LIGHT DUTY

HB( )
M-2 STEEL

YB( )
M-2 STRAIGHT GRIND





ROUND

+.0005 −.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

** NOTE ON BLANKS NOMINAL SIZE −.0002 −.0004

UNIVERSAL CODE: 1201 (SEE PAGE 67)

Shank		Point Length B			Round		Shape		Overall Length L								
		NAPMA	Alternate		Min.	Range	Min.	Min. Max.									
D	Code	S	B	C	SP	P**	SW	W DIAG.	*2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
.250	102	.500	.750		.050	.062-.250	.050	.062-.249	X	X	X	X	X	X	X		
.375	103	.625	.750	1.00	.115	.125-.375	.115	.125-.374	X	X	X	X	X	X	X	X	X
.500	104	.750	.750	1.00	.158	.187-.500	.158	.187-.499	X	X	X	X	X	X	X	X	X
.625	105	.875	.750	1.00	.158	.312-.625		.250-.624	.158	X	X	X	X	X	X	X	X
.750	106	.937	.750	1.00	.235	.437-.750		.312-.749	.235	X	X	X	X	X	X	X	X
.875	107	.937	.750	1.00	.300	.625-.875		.375-.874	.235	X	X	X	X	X	X	X	X
1.000	108	.937	.750	1.00	.350	.750-1.000		.437-.999	.235	X	X	X	X	X	X	X	X

*AVAILABLE IN “S” POINT LENGTH ONLY

HOW TO ORDER

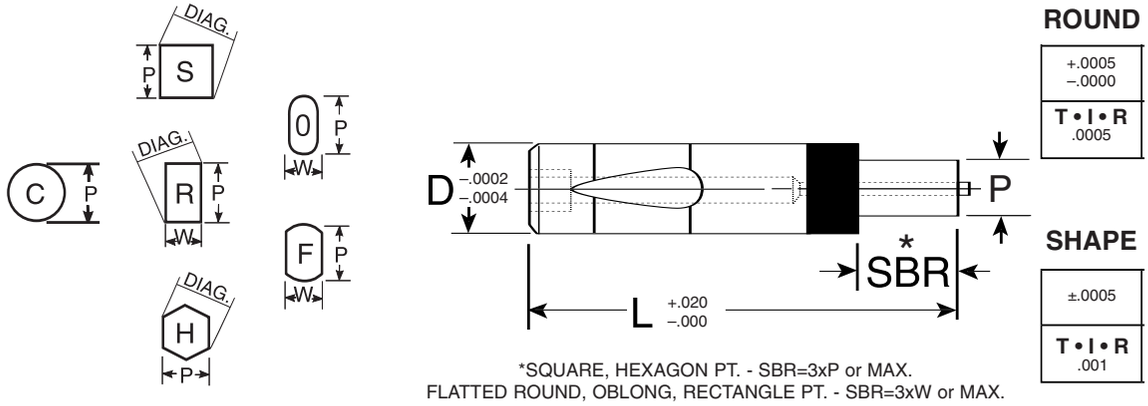
TYPE	D	L	B	P
YBC	103	3	B	.187

STEEL: M2 R/C 60-62

WHIPSLEEVE EJECTOR PUNCH HEAVY DUTY

XE( )

M-2 STEEL



*SQUARE, HEXAGON PT. - SBR=3xP or MAX.
FLATTED ROUND, OBLONG, RECTANGLE PT. - SBR=3xW or MAX.

Shank			Round	Shape		Overall Length L					
D	Code	MAX SBR	Range P	Min. W	Max. DIAG.	2.50	2.75	3.00	3.50	3.75	4.00
.375	113	.62	.093-.218	.093-.218		X	X	X	X	X	X
.500	114	.62	.125-.297	.125-.297		X	X	X	X	X	X
.625	115	.62	.203-.375	.203-.375		X	X	X	X	X	X
.750	116	.75	.281-.500	.281-.500				X	X	X	X
.875	117	.75	.390-.625	.312-.625				X	X	X	X
1.000	118	.87	.468-.687	.437-.687				X	X	X	X
1.250	119	1.00	.687-.937	.500-.937				X	X	X	X

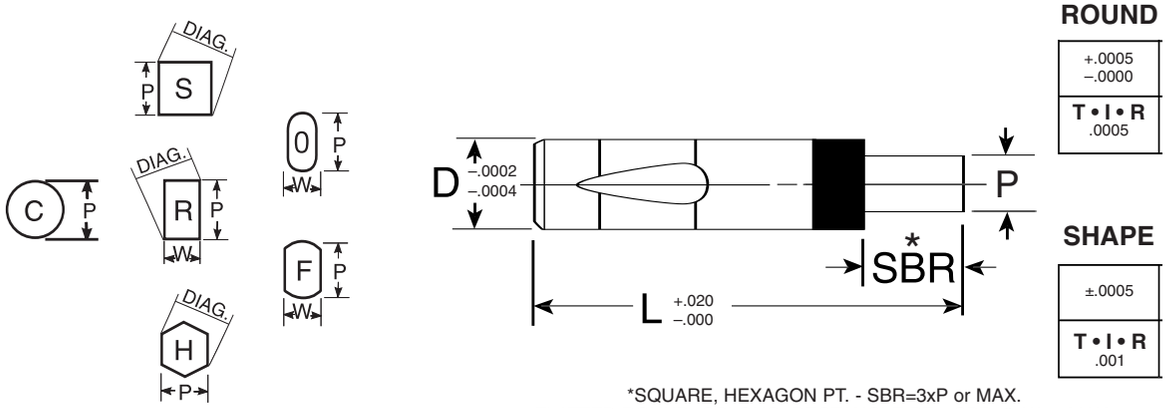
HOW TO ORDER

TYPE	D	L	P
XEC	114	3	.187

WHIPSLEEVE SOLID PUNCH HEAVY DUTY

XB( )

M-2 STEEL



*SQUARE, HEXAGON PT. - SBR=3xP or MAX.
FLATTED ROUND, OBLONG, RECTANGLE PT. - SBR=3xW or MAX.

Shank			Round	Shape		Overall Length L					
D	Code	MAX SBR	Range P	Min. W	Max. DIAG.	2.50	2.75	3.00	3.50	3.75	4.00
.375	113	.62	.093-.218	.093-.218		X	X	X	X	X	X
.500	114	.62	.125-.297	.125-.297		X	X	X	X	X	X
.625	115	.62	.203-.375	.203-.375		X	X	X	X	X	X
.750	116	.75	.281-.500	.281-.500				X	X	X	X
.875	117	.75	.390-.625	.312-.625				X	X	X	X
1.000	118	.87	.468-.687	.437-.687				X	X	X	X
1.250	119	1.00	.687-.937	.500-.937				X	X	X	X

HOW TO ORDER

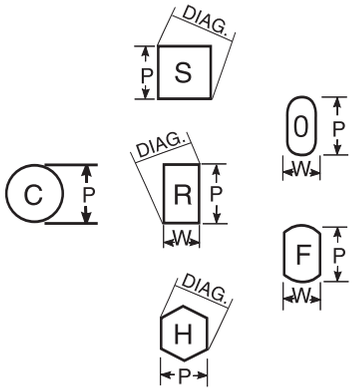
TYPE	D	L	P
XBC	114	3	.250

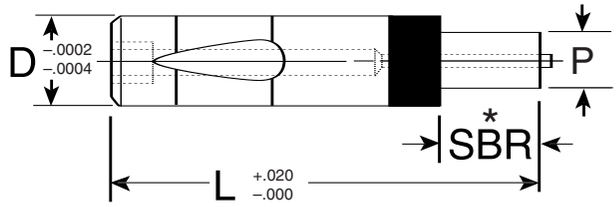
STEEL: M2 R/C 60-62

WHIPSLEEVE EJECTOR PUNCH LIGHT DUTY

XE( )

M-2 STEEL





*ROUND, SQUARE, HEXAGON PT. - SBR=3xP or MAX.
FLATTED ROUND, OBLONG, RECTANGLE PT. - SBR=3xW or MAX.

ROUND

+.0005 –.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

Shank		MAX	Round	Shape		Overall Length L					
D	Code		Range P	Min. W	Max. Diag.	2.00	2.25	2.50	2.75	3.00	3.50
.250	102	.37	.060-.125	.060-.125		X	X	X	X	X	
.375	103	.56	.093-.218	.093-.218		X	X	X	X	X	X
.500	104	.62	.125-.297	.125-.297		X	X	X	X	X	X
.625	105	.62	.203-.375	.203-.375				X	X	X	X
.750	106	.75	.281-.500	.281-.500				X	X	X	
.875	107	.75	.390-.625	.312-.625				X	X	X	
1.000	108	.87	.468-.687	.437-.687					X	X	

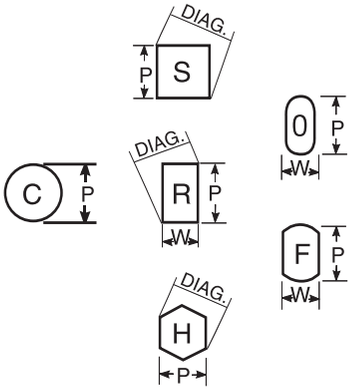
HOW TO ORDER

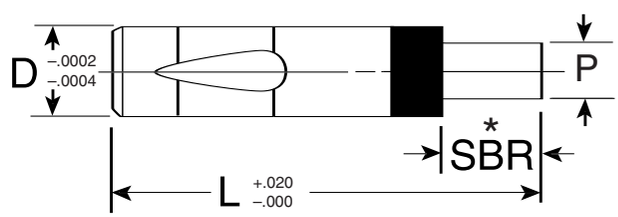
TYPE	D	L	P
XEC	104	3	.187

WHIPSLEEVE SOLID PUNCH LIGHT DUTY

XB( )

M-2 STEEL





*ROUND, SQUARE, HEXAGON PT. - SBR=3xP or MAX.
FLATTED ROUND, OBLONG, RECTANGLE PT. - SBR=3xW or MAX.

ROUND

+.0005 –.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001

Shank		MAX	Round	Shape		Overall Length L					
D	Code		Range P	Min. W	Max. Diag.	2.00	2.25	2.50	2.75	3.00	3.50
.250	102	.37	.060-.125	.060-.125		X	X	X	X	X	
.375	103	.56	.093-.218	.093-.218		X	X	X	X	X	X
.500	104	.62	.125-.297	.125-.297		X	X	X	X	X	X
.625	105	.62	.203-.375	.203-.375				X	X	X	X
.750	106	.75	.281-.500	.281-.500				X	X	X	
.875	107	.75	.390-.625	.312-.625				X	X	X	
1.000	108	.87	.468-.687	.437-.687					X	X	

HOW TO ORDER

TYPE	D	L	P
XBC	104	3	.187

STEEL: M2 R/C 60-62

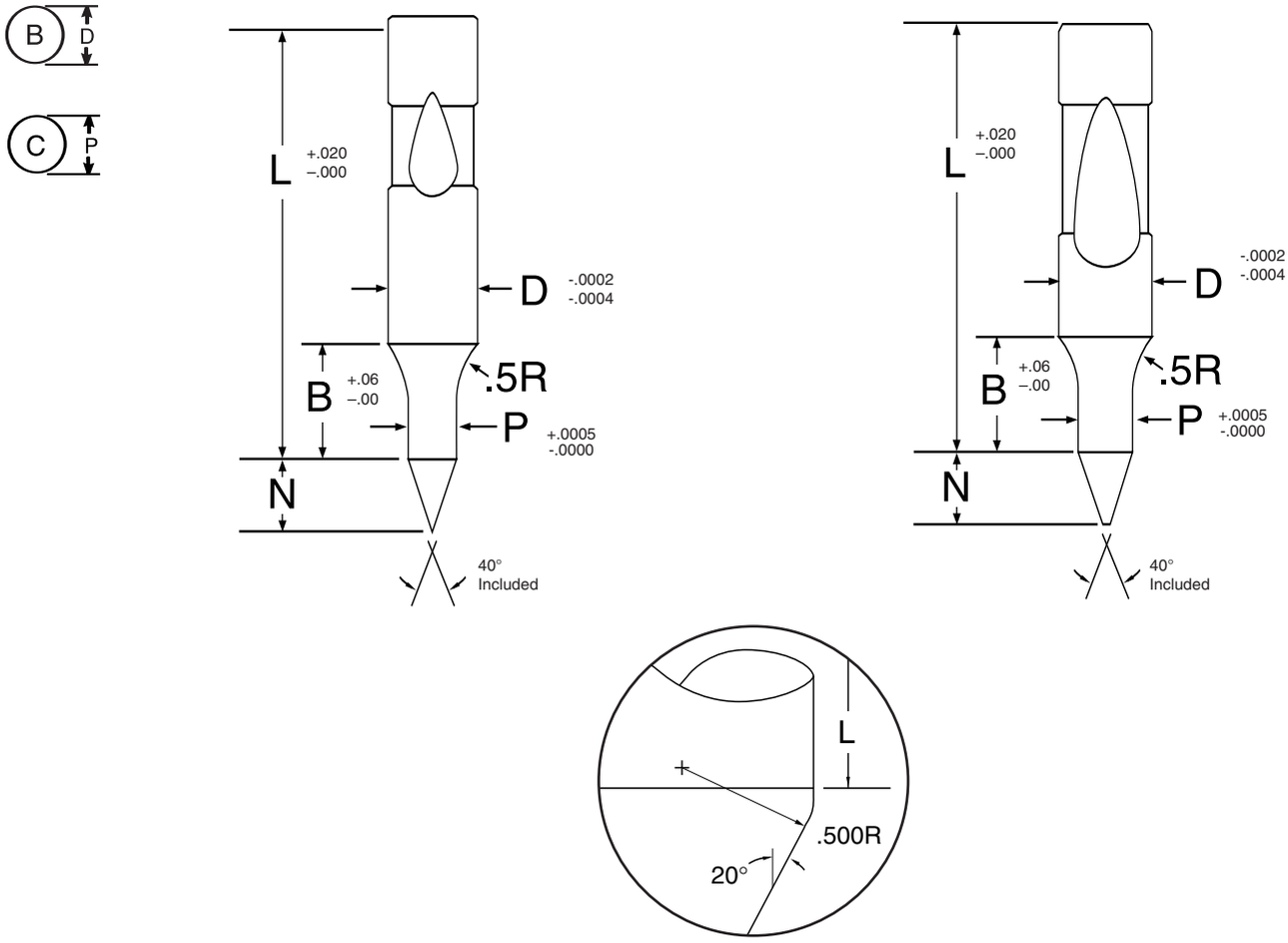
LONG NOSE PILOT
LIGHT DUTY & HEAVY DUTY

HLN( )

M-2 STEEL

Positive Pick Up Pilots

Concentricity: .0005 T.I.R.



UNIVERSAL CODE: 120108 & 130108 (SEE PAGE 69)

		Shank		Point Length	Round Range	Max	Length L											
		D	Code	B	P	N	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.50	4.75	5.00	5.25	5.50
LIGHT DUTY	HLN( )	103	.375	.62	.186-.375	.37	X	X	X	X	X	X	X					
	HLN( )	104	.500	.81	.249-.500	.50	X	X	X	X	X	X	X	X	X	X	X	X
	HLN( )	105	.625	.93	.311-.625	.62	X	X	X	X	X	X	X	X	X	X	X	X
	HLN( )	106	.750	1.06	.436-.750	.75	X	X	X	X	X	X	X	X	X	X	X	X
	HLN( )	107	.875	1.18	.624-.875	.87	X	X	X	X	X	X	X	X	X	X	X	X
	HLN( )	108	1.000	1.25	.749-1.000	1.00	X	X	X	X	X	X	X	X	X	X	X	X
HEAVY DUTY	HLN( )	113	.375	.62	.186-.375	.37	X	X	X	X	X	X	X					
	HLN( )	114	.500	.81	.249-.500	.50	X	X	X	X	X	X	X	X	X	X	X	X
	HLN( )	115	.625	.93	.311-.625	.62	X	X	X	X	X	X	X	X	X	X	X	X
	HLN( )	116	.750	1.06	.436-.750	.75	X	X	X	X	X	X	X	X	X	X	X	X
	HLN( )	117	.875	1.18	.624-.875	.87		X	X	X	X	X	X	X	X	X	X	X
	HLN( )	118	1.000	1.25	.749-1.000	1.00			X	X	X	X	X	X	X	X	X	X
	HLN( )	119	1.250	1.44	.999-1.250	1.25			X	X	X	X	X	X	X	X	X	X

HOW TO ORDER

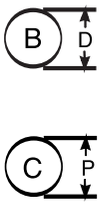
TYPE	D	L	P
HLNC	104	3	.250

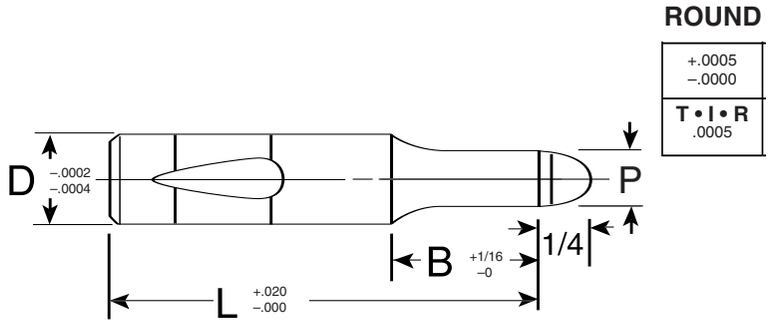
STEEL: M2 R/C 60-62

REGULAR PILOTS / LIGHT DUTY

HN( )

M-2 STEEL





UNIVERSAL CODE: 120107 (SEE PAGE 69)

** NOTE ON BLANKS NOMINAL SIZE –.0002 –.0004

Shank		Point Length B			Round		Length L								
		NAPMA	Alternate		Min.	Range									
D	Code	S	B	C	SP	P**	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
.250	102	.500	.750		.050	.062-.250	X	X	X	X	X	X	X		
.375	103	.625	.750	1.00	.061	.125-.375	X	X	X	X	X	X	X	X	X
.500	104	.750	.750	1.00	.092	.187-.500	X	X	X	X	X	X	X	X	X
.625	105	.875	.750	1.00	.124	.312-.625		X	X	X	X	X	X	X	X
.750	106	.937	.750	1.00	.234	.437-.750		X	X	X	X	X	X	X	X
.875	107	.937	.750	1.00	.299	.625-.875		X	X	X	X	X	X	X	X
1.000	108	.937	.750	1.00	.349	.750-1.000		X	X	X	X	X	X	X	X

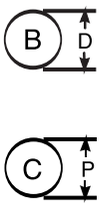
HOW TO ORDER

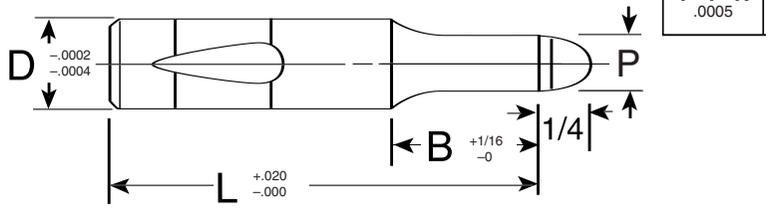
TYPE	D	L	B	P
HNC	104	3	S	.250

REGULAR PILOTS / HEAVY DUTY

HN( )

M-2 STEEL





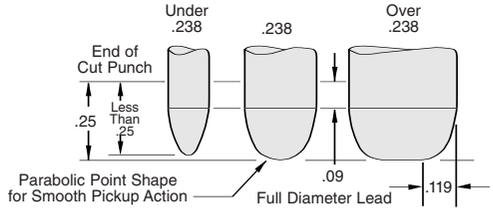
UNIVERSAL CODE: 130107 (SEE PAGE 69)

** NOTE ON BLANKS NOMINAL SIZE –.0002 –.0004

Shank		Point Length B				Round		Length L									
		NAPMA	Alternate			Min.	Range										
D	Code	S	B	C	D	SP	P**	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	5.00
.375	113	.625	.750	1.00		.061	.092-.375	X	X	X	X	X	X	X			
.500	114	.812	.750	1.00	1.25	.092	.186-.500	X	X	X	X	X	X	X	X	X	X
.625	115	.937	.750	1.00	1.25	.124	.311-.625	X	X	X	X	X	X	X	X	X	X
.750	116	1.062	.750	1.00	1.25	.234	.436-.750	X	X	X	X	X	X	X	X	X	X
.875	117	1.187	.750	1.00	1.25	.299	.624-.875		X	X	X	X	X	X	X	X	X
1.000	118	1.250	.750	1.00	1.25	.349	.749-1.000			X	X	X	X	X	X	X	X
1.250	119	1.437	.750	1.00	1.25	.449	.999-1.250			X	X	X	X	X	X	X	X

HOW TO ORDER

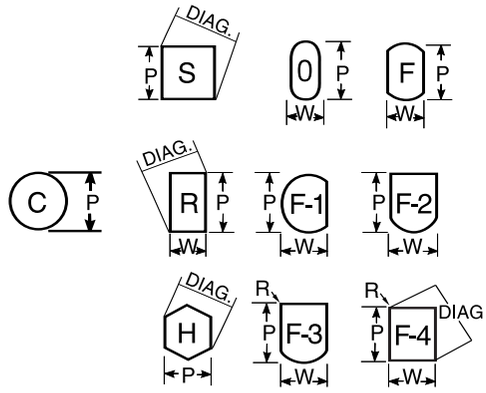
TYPE	D	L	B	P
HNC	114	4	C	.250



KNOB STYLE PUNCHES
HEAVY DUTY

HKN( )
(SOLID)
M-2 STEEL

HKE( )
(EJECTOR)
M-2 STEEL

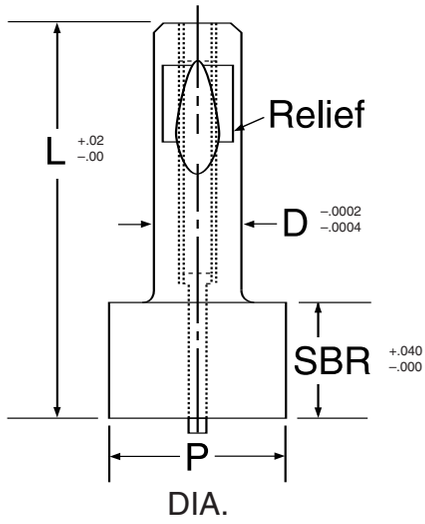


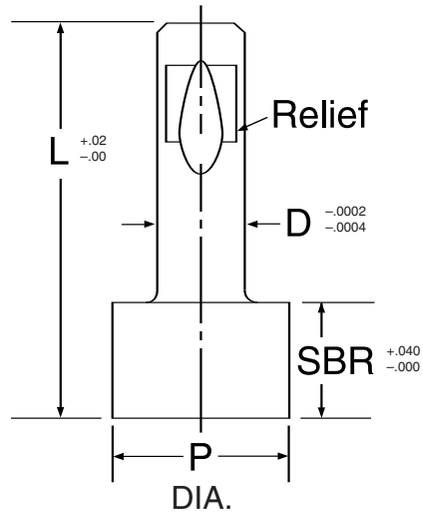
ROUND

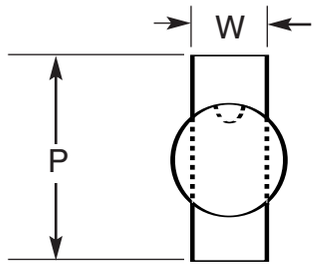
+.0005 −.0000
T • I • R .0005

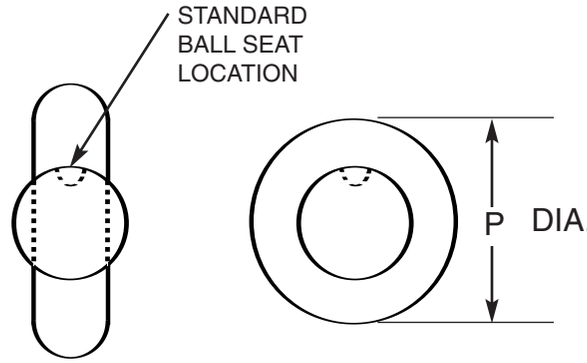
SHAPE

±.0005
T • I • R .001









VIEW THROUGH SHANK

Shank D	Shank Code	SBR	Round Range P	Shape Min. W	Shape Max. DIAG.	Overall Length L 2.50	3.00	3.50	4.00
.500	114	.75	.501-1.250	.188-1.250		X	X	X	X
.625	115	.88	.626-1.500	.250-1.500		X	X	X	X
.750	116	.94	.751-1.500	.312-1.500		X	X	X	X
.875	117	.94	.876-1.750	.375-1.750		X	X	X	X
1.000	118	.94	1.001-1.750	.437-1.750		X	X	X	X
1.250	119	1.25	1.251-2.000	.500-2.000			X	X	X

HOW TO ORDER

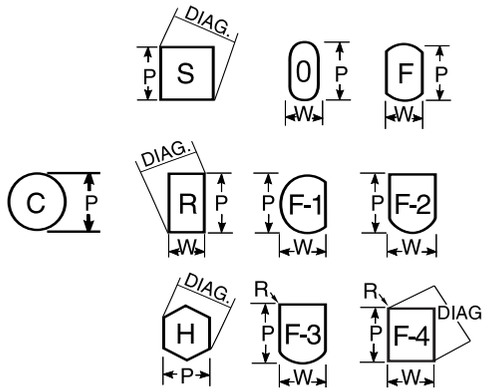
TYPE	D	L	P
HKNC	115	4.00	1.125

STEEL: M2 R/C 60-62

KNOB STYLE PUNCHES
LIGHT DUTY

LKN( )
(SOLID)
M-2 STEEL

LKE( )
(EJECTOR)
M-2 STEEL

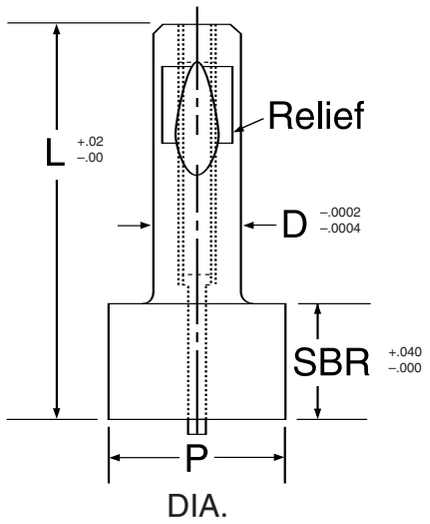


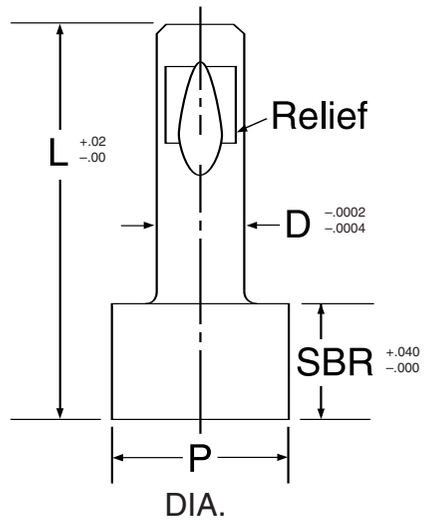
ROUND

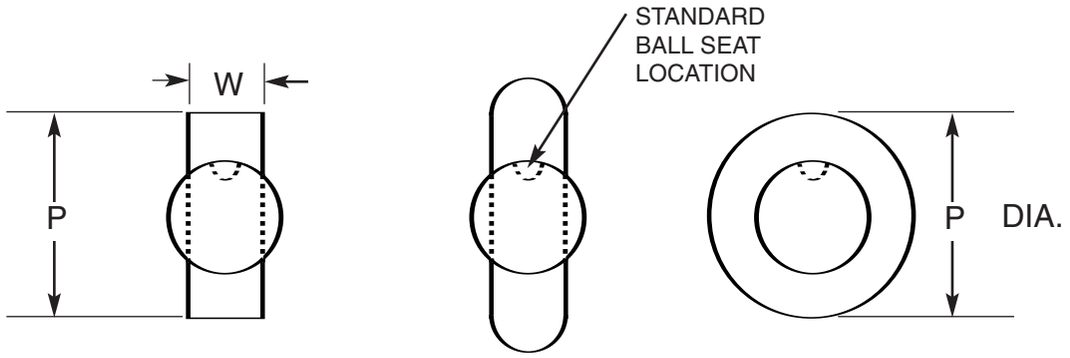
+.0005 −.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001







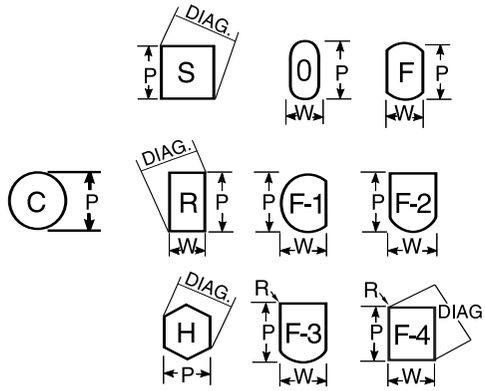
VIEW THROUGH SHANK

Shank			Round	Shape		Overall Length L			
D	Code	SBR	Range P	Min. W	Max. DIAG.	2.50	3.00	3.50	4.00
.500	104	.75	.501-1.250	.188-1.250		X	X	X	X
.625	105	.88	.626-1.500	.250-1.500		X	X	X	X
.750	106	.94	.751-1.500	.312-1.500		X	X	X	X
.875	107	.94	.876-1.750	.375-1.750		X	X	X	X
1.000	108	.94	1.001-1.750	.437-1.750		X	X	X	X

HOW TO ORDER

TYPE	D	L	P
LKNC	105	3.50	1.250

HR( )
M-2 STEEL

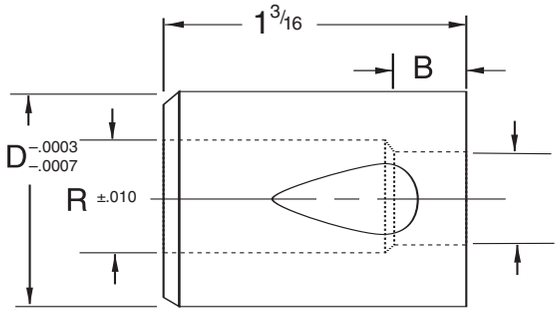


ROUND

+.0005 –.0000
T • I • R .0005

SHAPE

±.0005
T • I • R .001



UNIVERSAL CODE: 1243 (SEE PAGE 69)

Shank		Min.	Max.	Round	Shape	
D	Code	B	R	Range P	Min. W	Max. DIAG.
.5000	4	.156	.228	.064-.195	.048-.195	
.6250	5	.187	.312	.126-.285	.064-.285	
.7500	6	.187	.375	.196-.345	.095-.345	
.8750	7	.187	.468	.286-.435	.127-.435	
1.0000	8	.250	.578	.346-.545	.158-.545	
1.2500	9	.250	.687	.436-.655	.189-.655	
1.5000	10	.250	.812	.546-.780	.220-.780	
1.7500	11	.312	1.062	.656-1.035	.252-1.035	

HOW TO ORDER

TYPE	D	P
HRC	5	.187

STANDARD ALTERATIONS
HEAVY DUTY

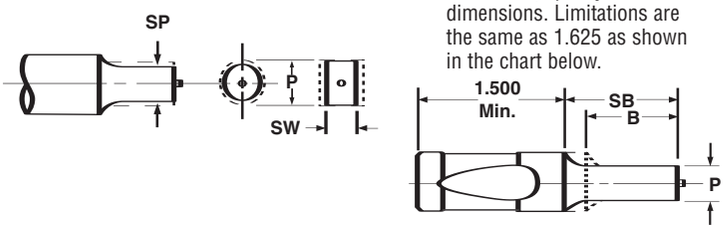
Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

Ejector

HE( ) YE( )

SP, SW **P & W Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

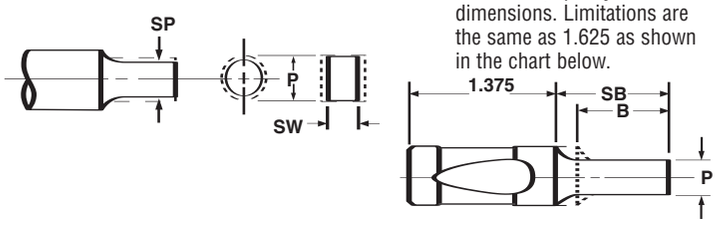
Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
113	.062	.062	.081	.081	.115	.115	.115	.115	.115
114	—	.158	.158	.158	.158	.158	.158	.158	.158
115	—	.158	.158	.158	.158	.158	.158	.158	.158
116	—	.235	.235	.235	.235	.235	.235	.235	.235
117	—	.300	.300	.300	.300	.300	.300	.300	.300
118	—	.350	.350	.350	.350	.350	.350	.350	.350
119	—	.450	.450	.450	.450	.450	.450	.450	.450
	Min. W (Shapes)								
113	.062	.062	.081	.081	.115	.115	.115	.115	.115
114	—	—	.158	.158	.158	.158	.158	.158	.158
115	—	—	.158	.158	.158	.158	.158	.158	.158
116	—	—	.235	.235	.235	.235	.235	.235	.235
117	—	—	.235	.235	.235	.235	.235	.235	.235
118	—	—	.235	.235	.235	.235	.235	.235	.235
119	—	—	.235	.235	.235	.235	.235	.235	.235

Solid

HB( ) YB( )

SP, SW **P & W Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

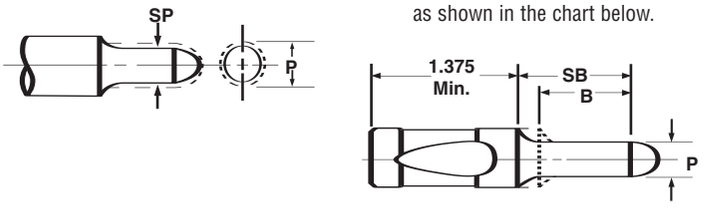
Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
113	.050	.050	.081	.081	.106	.115	.115	.115	.115
114	—	.093	.093	.093	.125	.125	.125	.125	.125
115	—	.125	.125	.125	.158	.158	.158	.158	.158
116	—	.235	.235	.235	.235	.235	.235	.235	.235
117	—	.300	.300	.300	.300	.300	.300	.300	.300
118	—	.350	.350	.350	.350	.350	.350	.350	.350
119	—	.450	.450	.450	.450	.450	.450	.450	.450
	Min. W (Shapes)								
113	.050	.050	.081	.081	.106	.115	.115	.115	.115
114	—	.093	.093	.093	.125	.125	.125	.125	.125
115	—	.125	.125	.125	.158	.158	.158	.158	.158
116	—	—	.235	.235	.235	.235	.235	.235	.235
117	—	—	.235	.235	.235	.235	.235	.235	.235
118	—	—	.235	.235	.235	.235	.235	.235	.235
119	—	—	.235	.235	.235	.235	.235	.235	.235

Pilots

HN( )

SP **P Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

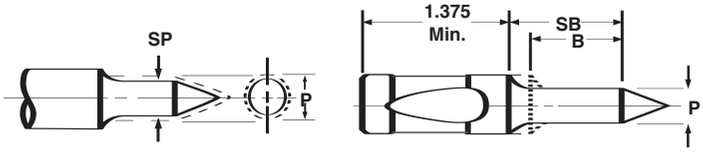
Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
113	.061	.061	.081	.080	.105	.114	.114	—	—
114	—	.092	.092	.092	.124	.124	.124	.124	.124
115	—	.124	.124	.124	.157	.157	.157	.157	.157
116	—	.234	.234	.234	.234	.234	.234	.234	.234
117	—	.299	.299	.299	.299	.299	.299	.299	.299
118	—	.349	.349	.349	.349	.349	.349	.349	.349
119	—	.449	.449	.449	.449	.449	.449	.449	.449

Long Nose Pilots

HLN( )

SP **P Dimensions Smaller than Standard**
SP<.186 Pilot is 1.5P in length.
SP<.083 Pilot needs to be >1.5P in length, therefore special.

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
113	.083	.083	.083	.083	.105	.114	.114	—	—
114	—	.092	.092	.092	.124	.124	.124	.124	.124
115	—	.124	.124	.124	.157	.157	.157	.157	.157
116	—	.234	.234	.234	.234	.234	.234	.234	.234
117	—	.299	.299	.299	.299	.299	.299	.299	.299
118	—	.349	.349	.349	.349	.349	.349	.349	.349
119	—	.449	.449	.449	.449	.449	.449	.449	.449

STANDARD ALTERATIONS
LIGHT DUTY

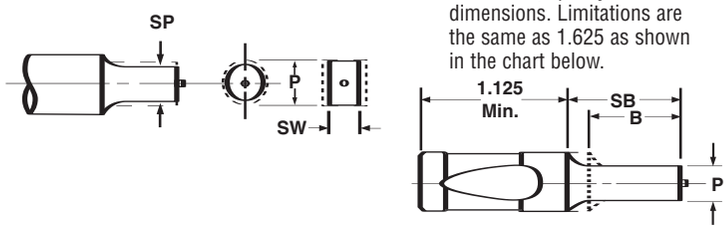
Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

Ejector

HE( ) YE( )

SP, SW **P & W Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

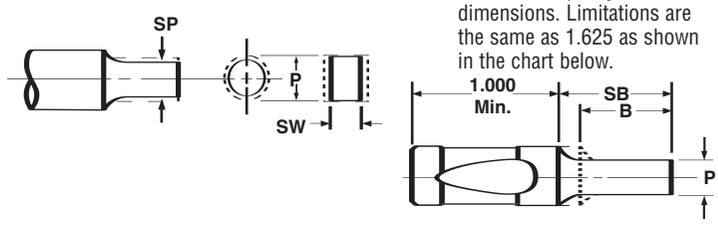
Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
102	.050	.050	—	—	—	—	—	—	—
103	.115	.115	.115	.115	.115	.115	.115	.115	.115
104	—	.158	.158	.158	.158	.158	.158	.158	.158
105	—	.158	.158	.158	.158	.158	.158	.158	.158
106	—	.235	.235	.235	.235	.235	.235	.235	.235
107	—	.300	.300	.300	.300	.300	.300	.300	.300
108	—	.350	.350	.350	.350	.350	.350	.350	.350
	Min. W (Shapes)								
102	.050	.050	—	—	—	—	—	—	—
103	.115	.115	.115	.115	.115	.115	.115	.115	.115
104	—	.158	.158	.158	.158	.158	.158	.158	.158
105	—	.158	.158	.158	.158	.158	.158	.158	.158
106	—	.235	.235	.235	.235	.235	.235	.235	.235
107	—	.235	.235	.235	.235	.235	.235	.235	.235
108	—	.235	.235	.235	.235	.235	.235	.235	.235

Solid

HB( ) YB( )

SP, SW **P & W Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

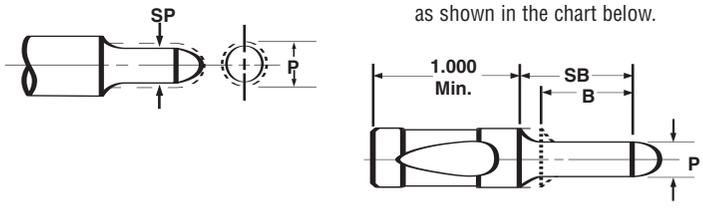
Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
102	.040	.040	.081	.081	.106	.115	—	—	—
103	.050	.050	.081	.081	.106	.115	.115	.115	.115
104	—	.093	.093	.093	.125	.125	.125	.125	.125
105	—	.125	.125	.125	.158	.158	.158	.158	.158
106	—	.235	.235	.235	.235	.235	.235	.235	.235
107	—	.300	.300	.300	.300	.300	.300	.300	.300
108	—	.350	.350	.350	.350	.350	.350	.350	.350
	Min. W (Shapes)								
102	.040	.040	.081	.081	.106	.115	—	—	—
103	.050	.050	.081	.081	.106	.115	.115	.115	.115
104	—	.093	.093	.093	.125	.125	.125	.125	.125
105	—	.125	.125	.125	.158	.158	.158	.158	.158
106	—	.235	.235	.235	.235	.235	.235	.235	.235
107	—	.235	.235	.235	.235	.235	.235	.235	.235
108	—	.235	.235	.235	.235	.235	.235	.235	.235

Pilots

HN( )

SP **P Dimensions Smaller than Standard**

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

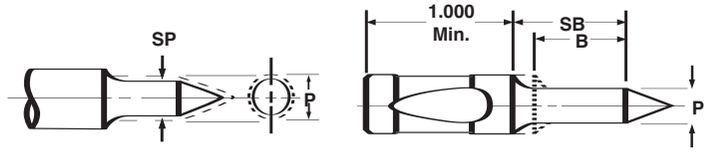
Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
102	.050	.050	—	—	—	—	—	—	—
103	.061	.061	.080	.080	.105	.114	.114	—	—
104	—	.092	.092	.092	.124	.124	.124	.124	.124
105	—	.124	.124	.124	.157	.157	.157	.157	.157
106	—	.234	.234	.234	.234	.234	.234	.234	.234
107	—	.299	.299	.299	.299	.299	.299	.299	.299
108	—	.349	.349	.349	.349	.349	.349	.349	.349

Long Nose Pilots

HLN( )

SP **P Dimensions Smaller than Standard**
SP<.186 Pilot is 1.5P in length.
SP<.083 Pilot needs to be >1.5P in length, therefore special.

SB **Point Length Longer than Standard**
For point lengths over 1.625 thru 2.000, specify SRL and dimensions. Limitations are the same as 1.625 as shown in the chart below.



SRL adds 3 days to delivery.

Point Length ▶	.5001 .6250	.6251 .7500	.7501 .8750	.8751 1.0000	1.0001 1.1250	1.1251 1.2500	1.2501 1.3750	1.3751 1.5000	1.5001 1.6250
Code	**Min. P (Rounds)**								
103	.083	.083	.083	.083	.105	.114	.114	—	—
104	—	.092	.092	.092	.124	.124	.124	.124	.124
105	—	.124	.124	.124	.157	.157	.157	.157	.157
106	—	.234	.234	.234	.234	.234	.234	.234	.234
107	—	.299	.299	.299	.299	.299	.299	.299	.299
108	—	.349	.349	.349	.349	.349	.349	.349	.349

Heavy Duty/Light Duty

TRUE® POSITION Retainers

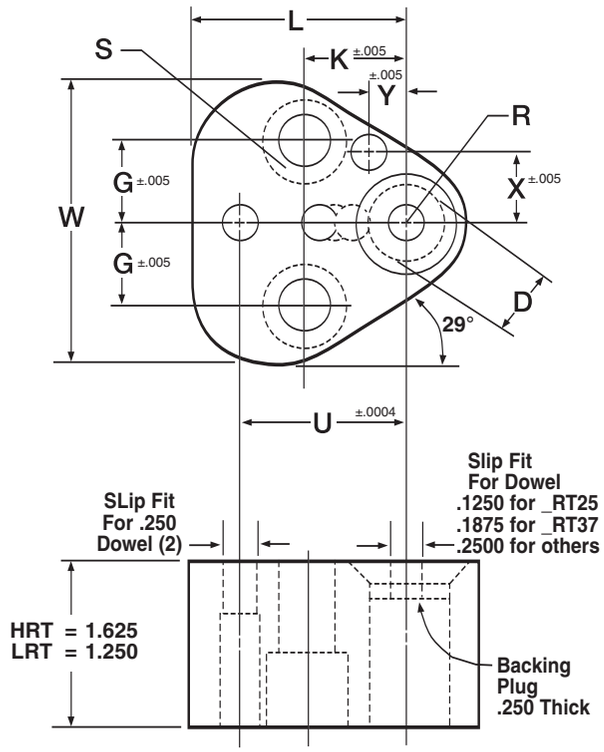
How to Order:

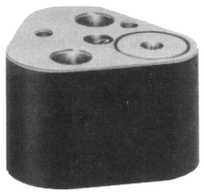
Qty	Type	D
23	*HRT*	*37*
13	*LRT*	*62*

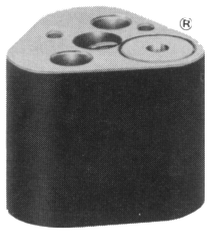
...The interchangeable retainer that is the industry standard

Benefits:

- Precise punch-to-bushing alignment assured with the in-line dowel feature. Reduces downtime, produces higher quality and maximizes punch life.
- Mounting time is reduced by45%, no more hand lifting. Simply pull a True Position Retainer from its box and screw it to the die set. True Position retainers are dimensionally accurate every time.
- Only one dowel is required for round punches which reduces machining time by 50%.
- The precision ground ball hole assures the precise alignment of shaped punches, even if the retainer is replaced.
- There is complete interchangeability between Heavy Duty and Light Duty retainers in the event of an engineering change.
- Cuts inventory in half







True Position® Retainer Sets include:

1 Ball	1 Spring
2 Screws	2 Dowels
1 Ball Release	Set Screw

Catalog Number

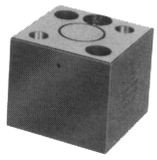
Heavy Duty	Light Duty	Code	D	G	K	L	R	S	U	W	See Note Above X	See Note Above Y	Screw Size
-	LRT	**25**	.2500	.438	.750	1.38	.38	.47	1.060	1.72	.354	.295	5/16-18
HRT	LRT	**37**	.3750	.438	.750	1.38	.38	.47	1.060	1.72	.354	.295	5/16-18
HRT	LRT	**50**	.5000	.562	.750	1.50	.50	.60	1.180	1.97	.472	.256	3/8-16
HRT	LRT	**62**	.6250	.625	.750	1.56	.56	.66	1.250	2.09	.532	.236	3/8-16
HRT	LRT	**75**	.7500	.688	.750	1.69	.69	.79	1.320	2.34	.650	.197	3/8-16
HRT	LRT	**87**	.8750	.688	.750	1.75	.75	.85	1.400	2.47	.728	.197	3/8-16
HRT	LRT	**100**	1.0000	.781	.938	1.88	.88	.97	1.600	2.72	.866	.276	1/2-13
HRT	-	**125**	1.2500	.781	.938	1.88	.88	.97	1.600	2.72	.866	.276	1/2-13

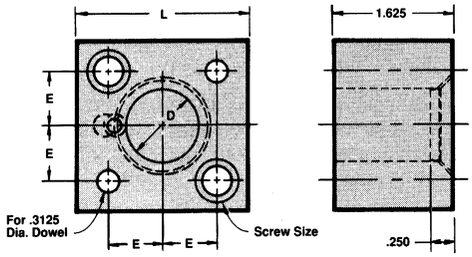
END & SQUARE RETAINERS

HEAVY DUTY

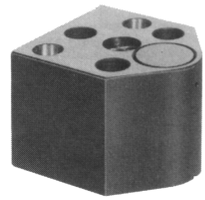
UNIVERSAL CODE: 136104 & 136105

HSR



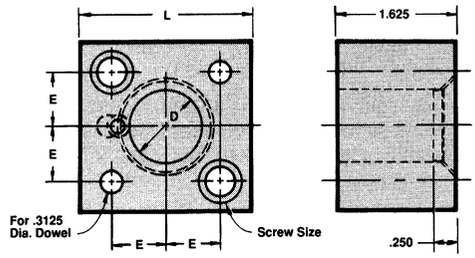


HER



Retainer Sets include:

Backing Plug — Screws
Ball — Dowels
Spring



HOW TO ORDER

QTY	TYPE	
12	HSR	35
12	HER	54

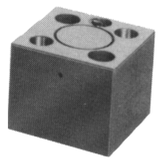
Catalog Number					Screw
Type	Code	D	L	E	Size
HSR	33	.5000	1.88	.562	3/8-16
HSR	34	.6250	2.00	.625	3/8-16
HSR	35	.7500	2.12	.688	3/8-16
HSR	36	.8750	2.38	.750	1/2-13
HSR	37	1.0000	2.38	.750	1/2-13
HSR	38	1.2500	2.62	.812	1/2-13

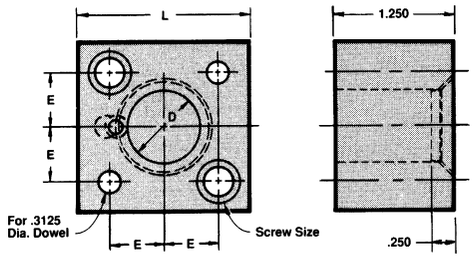
Catalog Number							Screw
Type	Code	D	L	J	R	Y	Size
HER	53	.5000	1.75	.375	.50	40°	3/8-16
HER	54	.6250	1.81	.438	.56	45°	3/8-16
HER	55	.7500	1.88	.500	.69	60°	3/8-16
HER	56	.8750	1.94	.562	.75	60°	3/8-16
HER	57	1.0000	2.00	.625	.81	60°	3/8-16
HER	58	1.2500	2.12	.750	1.00	-	3/8-16

LIGHT DUTY

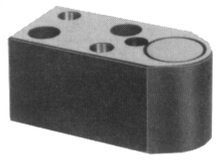
UNIVERSAL CODE: 126104 & 126105

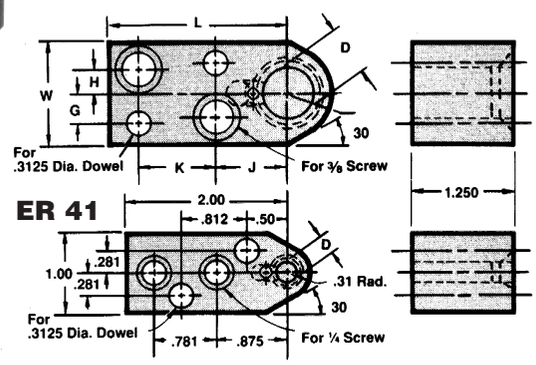
SR





ER





Retainer Sets include:

Backing Plug — Screws
Ball — Dowels
Spring

HOW TO ORDER

QTY	TYPE	
10	SR	23
12	ER	42

Catalog Number					Screw
Type	Code	D	L	E	Size
SR	21	.2500	1.25	.312	1/4-20
SR	22	.3750	1.38	.375	5/16-18
SR	23	.5000	1.50	.438	5/16-18
SR	24	.6250	1.62	.500	5/16-18
SR	25	.7500	1.88	.562	3/8-16
SR	26	.8750	2.00	.625	3/8-16
SR	27	1.0000	2.25	.750	3/8-16
*SR	28	1.2500	2.25	.750	3/8-16
*SR	29	1.5000	2.75	1.000	3/8-16
*SR	30	1.7500	2.75	1.000	3/8-16

Catalog Number										Screw
Type	Code	D	G	H	J	K	L	R	W	Size
ER	41	.2500	SEE DIAGRAM ABOVE							1/4-20
ER	42	.3750	.375	.281	.906	.969	2.25	.38	1.25	3/8-16
ER	43	.5000	.375	.281	.906	.969	2.25	.50	1.25	3/8-16
ER	44	.6250	.375	.281	.906	.969	2.25	.56	1.25	3/8-16
ER	45	.7500	.438	.344	1.125	1.000	2.50	.69	1.38	3/8-16
ER	46	.8750	.438	.344	1.125	1.000	2.50	.75	1.50	3/8-16
ER	47	1.0000	.438	.344	1.125	1.000	2.50	.81	1.62	3/8-16

*FURNISHED WITH BACKING PLATE INSTEAD OF BACKING PLUG

BALL RELEASE TOOLS AND REPLACEMENT BALLS & SPRINGS AVAILABLE. SEE PRICER.

pivot punch corporation

CATALOG INFORMATION

CATALOG INFORMATION INDEX

For Fast Deliveries. . .

pivot punch corporation

PIVOT FAST DELIVERY SCHEDULE (PFDS)

		Working Days														
		PUNCHES									DIE BUTTONS/GUIDES				
			STD	FORM	STD	LG. NOSE	EXPANDED	EXPANDED	KNOB STYLE	KNOB STYLE		STD	FORM	EXPANDED	EXPANDED
PRODUCT	QUANTITY	ROUND	SHAPE	SHAPE	PILOT	PILOT	ROUND	SHAPE	ROUND	SHAPE	ROUND	SHAPE	SHAPE	ROUND	SHAPE
SELECTIVE	1-19	2	4	6	3	3	6	8			2	4	6	6	8
BASIC	1-19	2	4	6	3	3					2	4	6		
BALLOCK	1-19	2	4	6	3	3			6	8	2	4	6		
ALL ABOVE	20-49	4	6	9	5	5	8	11	8	11	4	6	9	8	11
	STR. GRIND	+2	+2	+2											
	TONDRA														
	WHIPSLEEVE	+3	+3	+3											

Note: The day of receipt of order is not counted as a working day.

*And, When you need it even **FASTER. . .***

PIVOT QUICKIE SERVICE

- On all standard catalog items (1-19 qty.) except Expanded Series & PM Products
- PIVOT **guarantees** maximum delivery will be cut in half, or you don't pay the service charge.
- The service charge is 20% of the total order - Note: $30.00 minimum order.
- Please advise fastest shipping method - F.O.B. our plant.

*Or, for the **FASTEST** possible deliveries. . .*

PIVOT MAYDAY SERVICE

- On all standard catalog items (1-19qty.) except Expanded Series & PM Products
- PIVOT **guarantees** orders will be shipped with in 24 hours of receipt of order (phone orders only), or you don't pay the service charge.
- The service charge is $10.00 for each round, $15.00 for each shape - $30.00 minimum order.
- Please advise fastest shipping method - F.O.B. our plant.

LOCKING DEVICES

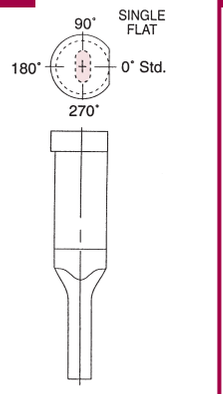
90°

180°

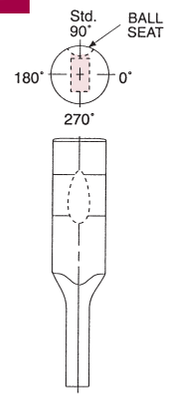
0°

270°

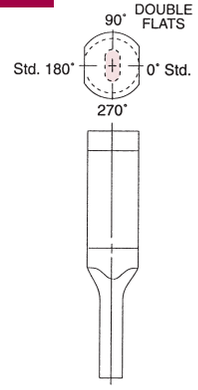
K-1



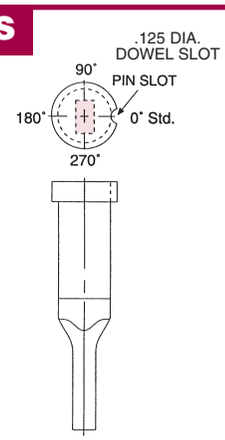
BS



K-2



DS



STANDARD LOCATIONS

K1 KEY FLAT 0°
K2 @ 0° AND 180°
DS DOWEL SLOT 0°
B/S BALL SEAT 90°

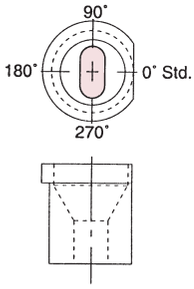
RADIAL DEGREES FOR NON-STANDARD LOCATIONS MUST BE SPECIFIED AT TIME OF ORDER. (COUNTER CLOCK-WISE FROM 0°) UNLESS OTHERWISE SPECIFIED, STANDARD LOCATION WILL BE FURNISHED.

ALL LOCKING DEVICES ARE SHOWN IN DIE POSITION.

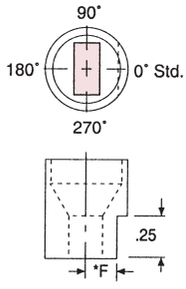
ALL PUNCH VIEWS ARE THROUGH SHANK

ALL DIE BUTTONS LAND-END VIEW

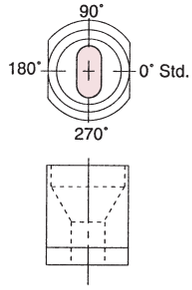
K-1



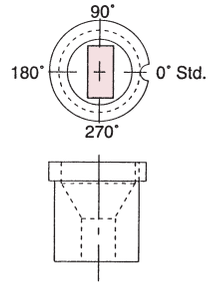
K-1



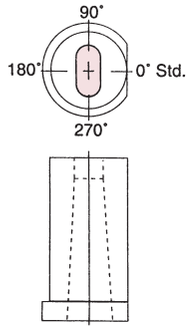
K-2



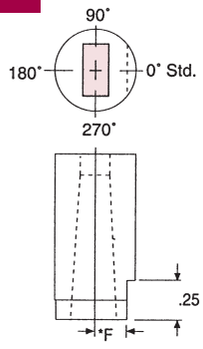
DS



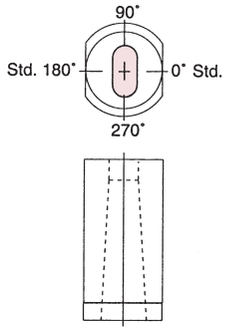
K-1



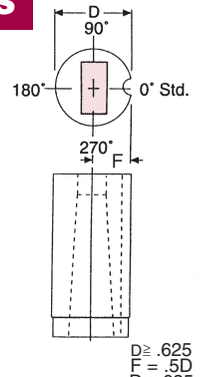
K-1



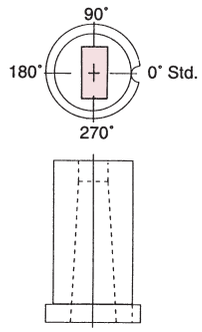
K-2

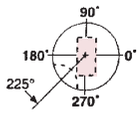


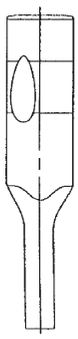
DS

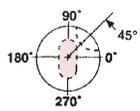


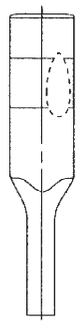
DS

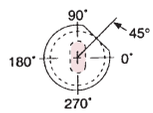


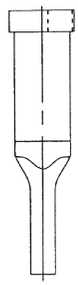


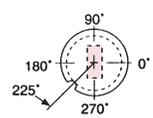


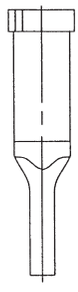










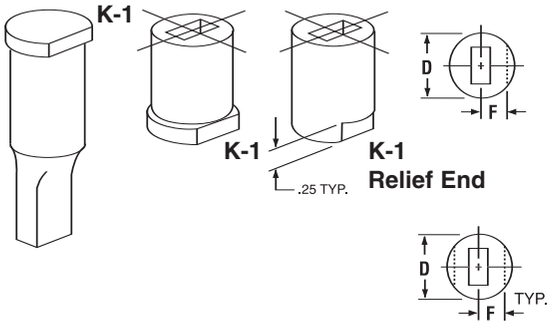


ALL LOCKING DEVICES ARE SHOWN IN DIE POSITION.

ALL PUNCH VIEWS ARE THROUGH SHANK

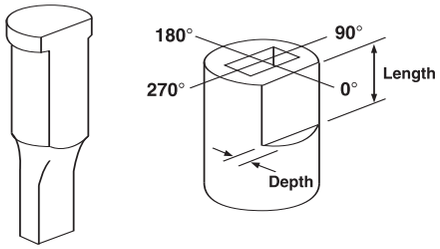
ALL DIE BUTTONS LAND-END VIEW

Flats



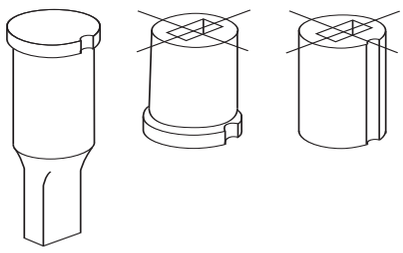
F Dimension (.5D on Headed Products)
Headless Die Buttons & Guide Busing Only

Body Dia.	18	25	31	37	43	50
F	.080	.110	.135	.165	.190	.220
Body Dia.	62	75	87	100	125	150
F	.270	.325	.380	.435	.540	.650
Body Dia.	175	200	225	250	275	
F	.775	.900	1.025	1.150	1.275	



Note: depth of flat is taken from shank, not the head on punches.

Dowel Slots



Standard and Alternate Locations

Definitions:
Standard Location is at 0°.
Alternate Location is 90°, 180° or 270°.
Alternate Locations are available at no additional charge.

Single Flats: K-1

Locking Devices	Punches	Die Button
K-1	On Head	Relief End

Order Example:
K-1 - 90°

Double Flats:

Locking Devices	Punches	Die Button
K-2	On Head	Relief End

Order Example:
K-2 - 90°
Second Flat is *always parallel* to the first flat.

Additional Flats

Code*	Depth	Length
K-5	.060	.500
K-6	.060	.625
K-7	.060	.750
K-8	.060	Full Length

Land End Shown
Relief End Optional

Dowel Slots: DS

Locking Devices	Dowel Dia.
DS	.125

Order Example:
DS - 180°

Custom Locations

Definition:
Custom Location is ***any angle other than:*** 0°, 90°, 180° or 270°.

Single Flats: K-3

Locking Devices	Punches	Die Button
K-3	On Head	Relief End

Order Example:
K-3 - 150°

Double Flats:

Locking Devices	Punches	Die Button
K-4	On Head	Relief End

Order Example:
K-4 - 150°
Second Flat is *always parallel* to the first flat.

Additional Flats

Code*	Depth	Length
K-9	.060	.500
K-10	.060	.625
K-11	.060	.750
K-12	.060	Full Length

Land End Shown
Relief End Optional

Dowel Slots: CDS

Locking Devices	Dowel Dia.
CDS	.125

Order Example:
CDS - 150°

Ball Seat: CBS

Order Example:
CBS - 110°

42 additional form shapes

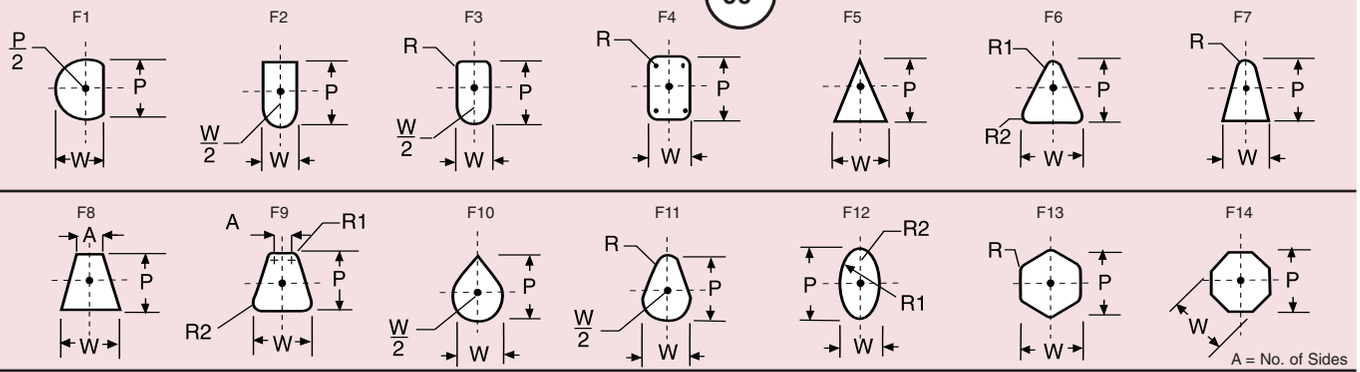
FOR PUNCHES: View through shank.
FOR DIES: View of land end.

AVAILABLE IN ALL CLASSIFICATIONS SHOWN IN THIS CATALOG –

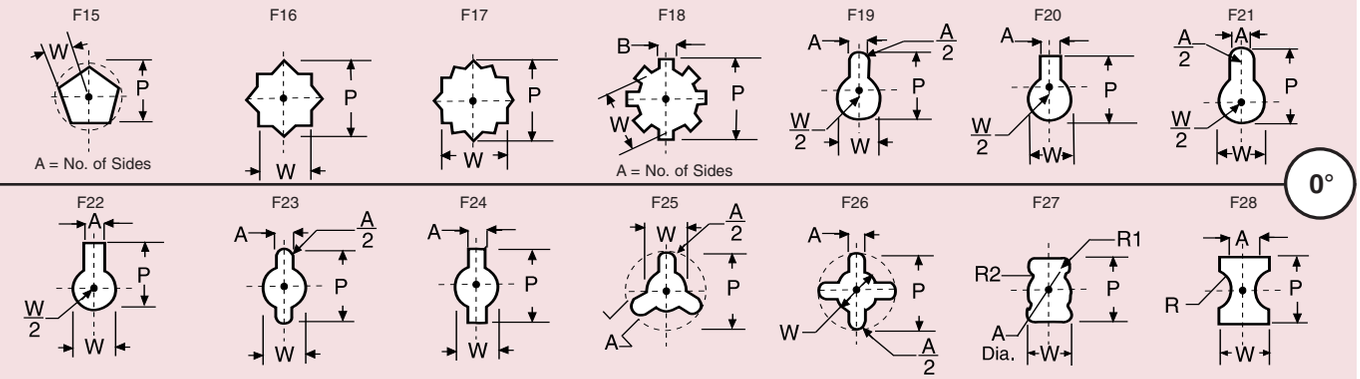
M2 High Speed Steel, Straight Ground or Whipsleeve

This easy to use table, designed to provide 42 additional form shapes without the need for special drawings, has been prepared for your ordering convenience. Pivot is also prepared to furnish other special shapes not shown, as required. When ordering shapes, other than shown below, submit twice size (or larger) drawing of point or hole and indicate sizes, tolerance required and relationship to shank or body centerlines and flats or dowels.

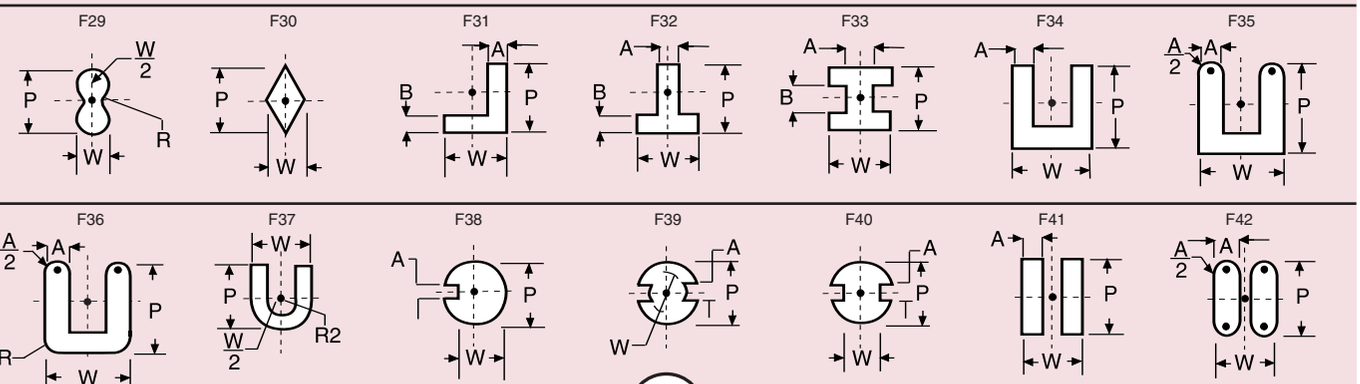
90°

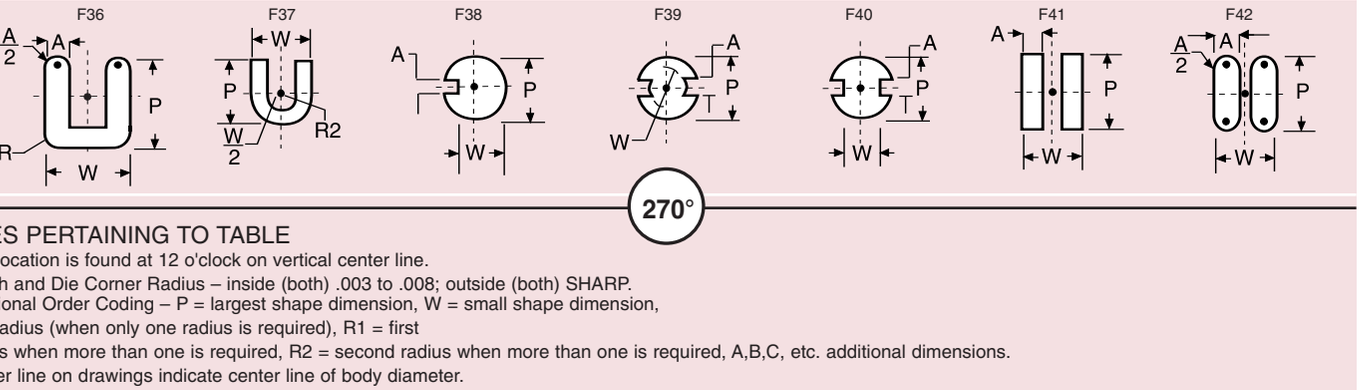


180°



0°





270°

NOTES PERTAINING TO TABLE

1. 90° Location is found at 12 o'clock on vertical center line.
2. Punch and Die Corner Radius – inside (both) .003 to .008; outside (both) SHARP.
3. Additional Order Coding – P = largest shape dimension, W = small shape dimension, R = radius (when only one radius is required), R1 = first radius when more than one is required, R2 = second radius when more than one is required, A,B,C, etc. additional dimensions.
4. Center line on drawings indicate center line of body diameter.
5. For standard method of keying punches, die buttons and guide bushings, see page 50.
6. Standard Ball Lock Location – Ball on "W" or 90° – See page 50.
7. Standard Dowel (DS) or Single Flat (K1) location is at 0° Degrees.

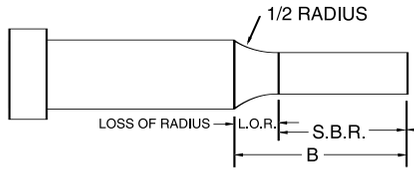
HOW TO ORDER

Steel	Punch	Shape	Body Dia. Code		Overall Length		P		W		A
H	S	F20	50	x	2-1/2	x	.437	x	.312	x	.125

LOSS OF RADIUS CHART

This catalog encompasses a full range of "B" dimension point lengths – 1/2"– 3/4" – 1" – 1-1/4" – 1-1/2". To calculate straight before radius or effective point length, use the following formula:

"B" less "LOR" from chart equals "S.B.R."



USE "W" DIM. FOR FLATTED ROUND – OBLONG – RECTANGLE
"P" DIM. FOR ROUND – SQUARE – HEXAGON

STRAIGHT BEFORE RADIUS
EFFECTIVE POINT LENGTH

BODY DIAMETER

	"W" or "P" POINT DIAMETERS 1/32" INCREMENTS														
"D"	**.031**	**.062**	**.093**	**.125**	**.156**	**.187**	**.218**	**.250**	**.281**	**.312**	**.343**	**.375**	**.406**	**.437**	**.468**
1/8	.212	.176	.125												
5/32	.241	.212	.176	.125											
3/16	.268	.241	.212	.176	.125										
1/4	.313	.292	.268	.241	.212	.176	.125								
5/16		.348	.313	.292	.268	.241	.212	.176	.125						
3/8			.348	.332	.313	.292	.268	.241	.212	.176	.125				
7/16			.377	.372	.348	.332	.313	.292	.268	.241	.212	.176	.125		
1/2				.382	.377	.364	.348	.332	.313	.292	.268	.241	.212	.176	.125
5/8						.414	.403	.391	.377	.364	.348	.332	.313	.292	.268
3/4									.424	.414	.403	.391	.377	.364	.348
1															.443

	"W" or "P" POINT DIAMETERS 1/32" INCREMENTS														
"D"	**.500**	**.531**	**.562**	**.593**	**.625**	**.656**	**.687**	**.718**	**.750**	**.781**	**.812**	**.843**	**.875**	**.906**	**.937**
5/8	.241	.212	.176	.125											
3/4	.332	.313	.292	.268	.241	.212	.176	.125							
1	.433	.424	.414	.403	.391	.377	.364	.348	.332	.313	.292	.268	.241	.212	.176

PUNCH SELECTION CHART

For selecting the best type punch and the right clearance, according to hardness of material, thickness of material, and low or high production, where good die-making principles are followed.

NOTICE: The chart below does not include Pivot's PM punches. In many applications much longer tool life can be achieved by substituting PM for added wear where HSS or HSS Straight Ground are indicated. If breaking or chipping we suggest CPM 3V. For more information, contact Pivot distributor.

SHADING INDICATES TYPE OF PUNCH

- High Speed Steel
- Straight Ground High Speed Steel
- Whipsleeve – High Speed Steel, Straight Grinding, and Tondra Treat are Standard

The chart below is based primarily on average punching requirements where material thickness is one half or less than punch diameter. Guiding of punches and point length should be determined by punch diameter to thickness ratio.

SHEAR STRENGTH LBS. PER SQ. IN.	BRINELL 10 mm BALL	TYPE OF MATERIAL			MATERIAL THICKNESS .005–.020								MATERIAL THICKNESS .021–.062							
						SHORT RUNS				LONG RUNS				SHORT RUNS				LONG RUNS			
					TOTAL CLEARANCE IN PERCENT OF MATERIAL THICKNESS		HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HSS (SG) WHIPSLEEVE®	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HSS (SG) WHIPSLEEVE®	TOTAL CLEARANCE IN PERCENT OF MATERIAL THICKNESS		HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HSS (SG) WHIPSLEEVE®	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HSS (SG) WHIPSLEEVE®
					.005-.020								.021-.062							
15,000 AND UNDER	35	PLASTIC PHENOLIC SHEET	PAPER LEATHER MASONITE	MIN.	3-3-1/2								3-1/2-4							
				STD.	4-4-1/2		2	3		2	1		4-1/2-5		2	3		2	1	
				MAX.	Var.								Var.							
20,000	45	ALUMINUM 2024-O SOFT		MIN.	3-1/2-4								4-5							
				STD.	5-6		2	3		2	1	3	6-7		2	3		2	1	
				MAX.	22%								22							
32,000	95	ALUMINUM 6061-T6 BRASS-YELLOW-SOFT	COPPER SOFT ZINC	MIN.	4-5								5-6							
				STD.	7-7-1/2		2	3		3	1	2	7-1/2-8		2	3		2	1	3
				MAX.	24								24							
40,000 TO 50,000	110 TO 130	ALUMINUM - 2024-T-3 HARD STEEL - SAE 1018 HOT ROLLED	BRASS 1/2 HARD	MIN.	5-6								6-7							
				STD.	9-10		2	3		3	1	2	10-11		1	2		2	1	
				MAX.	24								24							
		STEEL - GALVANIZED - SAE 1018	GALVANIZED LONG TERN	MIN.	5-6								6-7							
				STD.	9-10		3	1	2	3	1	2	10-11		3	1	2	3	1	2
				MAX.	24								24							
60,000	170	BRASS-YELLOW-HARD STEEL - SAE 1018 - COLD DRAWN		MIN.	5-6								6-7							
				STD.	10-11		2	3		2	1		11-12		2	3		3	1	2
				MAX.	25								25							
85,000	185	STAINLESS STEEL (ANNEALED)	MONEL NICKOL	MIN.	6-8								8-10							
				STD.	11-12		3	2	1	3	2	1	12-13		3	2	1	3	2	1
				MAX.	27								27							
100,000	200	TOOL STEEL (ANNEALED)		MIN.	7-8								8-10							
				STD.	12-13		3	2	1	3	2	1	13-14		3	2	1	3	2	1
				MAX.	30								30							
110,000	220	PHOSPHOR BRONZE (SPRING TEMPERED)		MIN.	14-16								16-18							
				STD.	16-18		3	2	1	3	2	1	18-21		3	2	1	3	2	1
				MAX.	30								30							
200,000	380	SPRING STEEL (TEMPERED)		MIN.	16-18								18-20							
				STD.	20-22		3	2	1	3	2	1	22-24		3	2	1	3	2	1
				MAX.	30								30							
RATIO PIERCING		WHERE THE STOCK THICKNESS APPROACHES OR IS GREATER THAN THE POINT DIAMETER 2-1 MAXIMUM IN MILD STEEL – 115 BRINELL		MIN.	CHECK CLEAR. ABOVE								CHECK CLEAR. ABOVE							
				STD.																
				MAX.					1			1					1			1
SHAVING PUNCHES		FOR MATERIALS LESS THAN 205 BRINELL		MIN.	METAL TO METAL															
				STD.			3	2	1	3	2	1	1-1-1/2		3	2	1	3	2	1
				MAX.																
HOT PUNCHING		1550° FAHRENHEIT MAXIMUM	CASTINGS FORGINGS	MIN.									3-4							
				STD.									5-6		1	2		2	1	
				MAX.																

Boxes with numbers indicate first, second or third choice of punch, and recommended clearance.
Boxes without numbers indicate it is possible to use the punch and clearance shown depending on the application.
White blocks are not generally recommended.

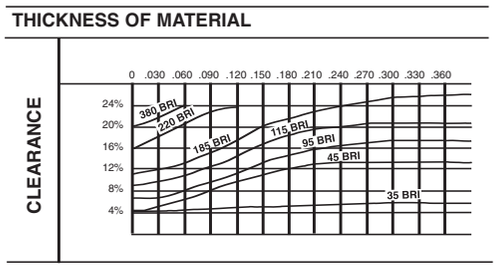
MATERIAL THICKNESS .063–.125					MATERIAL THICKNESS .126–.375				
	SHORT RUNS		LONG RUNS			SHORT RUNS		LONG RUNS	
TOTAL CLEARANCE IN PERCENT OF MATERIAL THICKNESS	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	TOTAL CLEARANCE IN PERCENT OF MATERIAL THICKNESS	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)
.063-.125		HSS (SG) WHIPSLEEVE®		HSS (SG) WHIPSLEEVE®	.126-.375		HSS (SG) WHIPSLEEVE®		HSS (SG) WHIPSLEEVE®
4-4-1/2					4-1/2-5				
5-5-1/2	2	3	2	1	5-1/2-5	2	3	2	1
Var.					Var.				
5-6					6-7				
7-10	2	3	3	1 2	10-14	2	1 3	3	1 2
22					22				
6-7					7-8				
8-11	1	2 3	2	1 3	11-18	2	1 3	3	1 2
24					24				
7-8					8-9				
11-15	1	2 3	3	2 1	15-22	3	1 2	3	2 1
24					24				
7					8-9				
11-15	3	1 2	3	1 2	15-22	3	1 2	3	1 2
24					24				
7-8					8-9				
12-16	1	2 3	3	2 1	16-24	3	2 1	3	2 1
25					25				
10-12					12-15				
13-17	3	2 1	3	2 1	17-26	3	2 1	3	2 1
27					27				
10-12					12-17				
14-18	3	2 1	3	2 1	18-27	3	2 1	3	2 1
30					30				
18-20									
21-24	3	2 1	3	2 1					
30									
CHECK CLEAR. ABOVE					CHECK CLEAR. ABOVE				
		1					1		1
1-1/2-1					1-1/2				
1-1/2-2	3	2 1	3	2	2-2-1/2	3	2 1	3	2 1
4-5					5-6				
6-7	1	2	2	1	7-8	1	2	2	1

This chart can be used for materials not listed by comparing the Brinell hardness or the shearing strength of the material to be punched.

Shearing strength is approximately four fifths of tensile strength.

MINIMUM CLEARANCE Total both sides. The minimum clearances indicated will produce approximately 60% straight walled holes in materials up to 60,000 P.S.I. shearing strength. However, holes with straight walls 80% or more have been successfully pierced, by dropping the clearance to 4 to 5%, and using whipsleeve punches. Minimum clearance means minimum punch life and more punching pressure required.

STANDARD CLEARANCE Total both sides. The standard clearances indicated will produce approximately 40% straight walled holes in materials 50,000 P.S.I. shearing strength. Standard clearance will give average punch life.



To Find Clearance
Example:
Material to be punched – .187 hot rolled steel, standard clearance shown in chart is 15-22% for material thickness of .125 to .375.
By interpolating 17% is correct standard clearance.
17% of .187 = .032
Correct standard clearance .032 total both sides.

MAXIMUM CLEARANCE Total both sides. The maximum clearance indicated will produce approximately 25% straight walled holes in materials up to 100,000 P.S.I. shearing strength. Ejector punches must be used in most cases when the clearance exceeds 15%, and where the strength of the punch will allow. Maximum punch life is achieved and less press tonnage is required.

DIE BUTTONS – Available in M2 high speed steel. The same type of steel used for punches, is recommended in most cases when selecting die buttons.

STRAIGHT GRINDING – Available on all high speed punches. Straight grinding minimizes galling and pick-up while assuring easier stripping. Standard on Whipsleeve® punches.

RATIO PIERCING – Whipsleeve® punches are recommended when the material thickness approaches or is greater than the point diameter, or where material hardness exceeds 175 Brinell. For best results the metal sleeve should be guided in the stripper. Maximum clearance is advised for maximum punch life.

TONDRA® – Although not shown in the recommendations above, we strongly suggest that the user add the designation TONDRA® to all high speed punches and DIE BUTTONS and all straight ground high speed punches for longer life. TONDRA® imparts extreme surface hardness of 72-75 R/c. (.0005 to .001 deep.) standard on all Whipsleeve® punches

SLUG EJECTORS – We also strongly recommend that slug ejectors be used wherever physically possible to insure trouble free production. Slug ejectors guard against slugs being drawn back out of the die. This is more likely to occur when the clearance exceeds 15%, such as when punching hard or thick material. Minimum point diameter is .062. (If you have strength enough and room enough, use a slug ejector.)

RATIO PIERCING - SHAVING - HOT PUNCHING
The chart at left shows specialized punching applications that require special care in selecting the kind of steel and type of punch and die used, as well as the proper clearance. Use maximum clearance whenever possible in ratio piercing. Shaving punches and punches used in ratio piercing should always be guided in the stripper.

recommended percent of clearances

Clearances are total, both sides, and are indicated according to hardness and thickness of material. They are based upon average punching requirements where thickness of the material is approximately one-half or less than the diameter of the punch point. Note that recommended minimum, standard and maximum clearances are quoted in percent of thickness of material.

Die buttons - The same type of steel used for punches, is recommended in most cases when selecting die buttons.

Slug Ejectors - We also strongly recommend that slug ejectors be used wherever physically possible to insure trouble free production. Slug ejectors guard against slugs being drawn back out of the die. This is more likely to occur when the clearance exceeds 15%, such as when punching hard or thick material. Minimum point diameter is .062. (If you have strength enough and room enough, use a slug ejector.)

SHEAR STRENGTH LBS. PER SQ. IN.	BRINNELL 10mm BALL	TYPE OF MATERIAL		TOTAL CLEARANCE IN PERCENT OF MATERIAL THICKNESS			
					.005-.020	.021-.062	.063-.125	.126-.375
15,000 AND UNDER	35	PHONEOLIC SHEET	PAPER LEATHER MASONITE	MIN.	3-3 1/2	3 1/2-4	4-4 1/2	4 1/2-5
				STD.	4-4 1/5	4 1/2-5	5-5 1/2	5 1/2-6
				MAX.	Var.	Var.	Var.	Var.
20,000	45	ALUMINUM 2024-0 SOFT	COPPER SOFT ZINC	MIN.	3 1/2-4	4-5	5-6	6-7
				STD.	5-6	6-7	7-10	10-14
				MAX.	22	22	22	22
32,000	95	ALUMINUM 6061 -T6 BRASS YELLOW-SOFT		MIN.	4-5	5-6	6-7	7-8
				STD.	7-7 1/2	7 1/2-8	8-11	11-18
				MAX.	24	24	24	24
40,000 TO 50,000	110 TO 130	ALUMINUM 2024-T-3 HARD STEEL - SAE 1018 HOT ROLLED	BRASS 1/2 HARD	MIN.	5-6	6-7	7-8	8-9
				STD.	9-10	10-11	11-15	15-22
				MAX.	24	24	24	24
		STEEL- GALVANIZED- SAE 1018	GALVANNEALED LONG TERN	MIN.	5-6	6-7	7	8-9
				STD.	9-10	10-11	11-15	15-22
				MAX.	24	24	24	24
60,000	170	BRASS - YELLOW - HARD STEEL - SAE 1018 - COLD DRAWN		MIN.	5-6	6-7	7-8	8-9
				STD.	10-11	11-12	12-16	16-24
				MAX.	25	25	25	25
85,000	185	STAINLESS STEEL	MONEL NICKOL	MIN.	6-8	8-10	10-12	12-15
				STD.	11-12	12-13	13-17	17-26
				MAX.	27	27	27	27
100,000	200	TOOL STEEL (ANNEALED)		MIN.	7-8	8-10	10-12	12-15
				STD.	12-13	13-14	14-18	18-27
				MAX.	30	30	30	30
110,000	220	PHOSPHOR BRONZE (SPRING TEMPERED)		MIN.	14-16	16-18	18-20	
				STD.	16-18	18-21	21-24	
				MAX.	30	30	30	
200,000	380	SPRING STEEL (TEMPERED)		MIN.	16-18	18-20		
				STD.	20-22	22-24		
				MIN.	30	30		

STANDARD ALTERATIONS

Standard Alterations Solid Punches

Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

SD **Reduced Shank Diameter**
Head diameter does not change with body diameter.

Shank Dia.	12	18	25	31	37	43	50	62	75	87	100
Min. SD	.063	.126	.188	.251	.313	.376	.438	.562	.688	.812	.938

SL **Overall Length Shortened (1.00 min.)**
Stock removal from point end which shortens B length. To maintain “B” specify “SB”

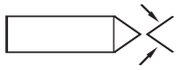
PLL **Precision Overall Length**
Same as SL except overall length is held to ±.001.

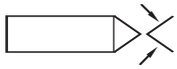
ST **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

PTT **Precision Head Thickness**
Same as ST except head thickness tolerance is held to ±.0005

SH **Reduced Head Diameter**
Minimum head diameter equals D + .000 - .001

SLD **Longer Lead on Punches**

CS6  60°

CS9  90°

Standard Alterations Ejector Punches

Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

SD **Reduced Shank Diameter**
Head diameter does not change with body diameter.

Shank Dia.	18	25	31	37	43	50	62	75	87	100
Min. SD	.172	.218	.282	.344	.376	.438	.562	.688	.812	.938

SL **Overall Length Shortened (1.00 min.)**
Stock removal from point end which shortens B length. To maintain “B” specify “SB”

PLL **Precision Overall Length**
Same as SL except overall length is held to ±.001.

ST **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

PTT **Precision Head Thickness**
Same as ST except head thickness tolerance is held to ±.0005

SH **Reduced Head Diameter**
Minimum head diameter equals D + .000 - .001

SEC **Smaller Ejector Components**
See page 66

TONDRA® (.050 MIN)
A unique wear-resistant surface treatment for M2 & PM only.

STN Titanium Nitride coating for extra wear. For M2 & PM only.

STANDARD ALTERATIONS

Standard Alterations Pilot Punch

Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

SD **Reduced Shank Diameter**
Head diameter does not change with body diameter.

Shank Dia.	12	18	25	31	37	43	50	62	75	87	100
Min. SD	.063	.126	.188	.251	.313	.376	.438	.562	.688	.812	.938

SL **Overall Length Shortened (1.00 min.)**
Stock removal from point end which shortens B length. To maintain “B” specify “SB”

ST **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

PTT **Precision Head Thickness**
Same as ST except head thickness tolerance is held to ±.0005

SH **Reduced Head Diameter**
Minimum head diameter equals D + .000 - .001

SLD **Longer Lead on Punches**

Standard Alterations Long Nose Pilot

Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

SD **Reduced Shank Diameter**
Head diameter does not change with body diameter.

Shank Dia.	37	43	50	62	75	87	100
Min. SD	.313	.376	.438	.562	.688	.812	.938

SL **Overall Length Shortened (1.00 min.)**
Stock removal from point end which shortens B length. To maintain “B” specify “SB”

ST **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

PTT **Precision Head Thickness**
Same as ST except head thickness tolerance is held to ±.0005

SH **Reduced Head Diameter**
Minimum head diameter equals D + .000 - .001

TONDRA® (.050 MIN)
A unique wear-resistant surface treatment for M2 & PM only.

STN Titanium Nitride coating for extra wear. For M2 & PM only.

Standard Alterations Die Buttons

Standard alterations are the ranges beyond those sizes listed in the catalog which can be manufactured for a slight additional charge.

SP, SW

P & W Dimensions Larger than Standard

Body Code	Max DIAG.
18	.130
25	.190
31	.240
37	.290
43	.340
50	.390
62	.500
75	.600
87	.700
100	.800
125	1.000
150	1.200

SB

Land Length Shorter or Longer than Standard

Rounds	
Hole Range	**Max B**
.0310-.0620	2P
.0621-.0930	.187
.0931-.1580	.250
.1581-.2350	.312
.2351-.3000	.375
.3001-.4000	.437
.4001-Over	.500

SD

Reduced Body Dia.
Head dia. does not change with body reduction.

Body Code	Min SD	Max DIAG.
18	.126	.076
25	.188	.130
31	.251	.190
37	.313	.240
43	.376	.290
50	.438	.340
62	.562	.437
75	.688	.550
87	.813	.650
100	.938	.750
125	1.188	.950
150	1.438	1.150

SL

Overall Length Shortened
Min. overall length: Headless = .25
Headed = .25 + T

PLL

Precision Overall Length
Same as SL except overall length is held to ± .001.

ST

Thinner Head than Standard
Stock removal from head and end which shortens overall length.

PTT

Precision Head Thickness
Same as ST except head thickness tolerance is held to ± .0005.

SH

Reduced Head Diameter
Minimum head diameter equals D + .000 - .001

TONDRA®

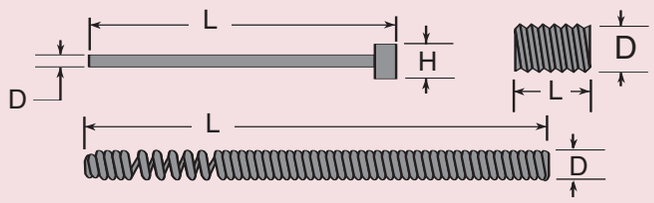
(.050 MIN)
A unique wear-resistant surface treatment for M2 & PM only.

STN

Titanium Nitride coating for extra wear.
For M2 & PM only.

EJECTOR DATA & EJECTOR KITS

REPLACEMENT KITS AVAILABLE FOR EJECTOR PUNCHES



	PIN SIZE			PIN HOLE	SPRING SIZE		SPRING HOLE	TAP SIZE	
	D	L	H		D	L		D	L
PE-2	.020	2	.072	.025	3/32	3	.106	5-40	1/8
PE-3	.030	2	.072	.035	1/8	3-1/4	.144	8-32	1/8
PE-4	.040	2	.072	.045	1/8	3-1/4	.144	8-32	1/8
PE-6	.060	2	.109	.065	1/8	3-1/4	.144	8-32	1/8
PE-9	.090	2	.187	.095	3/16	3-1/4	.213	1/4-20	3/16
PE-12	.120	2	.187	.125	3/16	3-1/4	.213	1/4-20	3/16

SELECTIVE		BASIC	
O.D.	PIN SIZE	O.D.	PIN SIZE
.1875	.020	.1875	.020
.250	.030	.250	.030
.3125	.040	.3125	.040
.375	.060	.375	.060
.4375	.060	.4375	.060
.500	.060	.500	.060
.625	.090	.625	.090
.750	.090	.750	.090
.875	.090	.875	.090
1.000	.090	1.000	.090
1.250	.120		
1.500	.120		
1.750	.120		
2.000	.120		
2.250	.120		
2.500	.120		

BALL LOCK			
LIGHT DUTY		HEAVY DUTY	
O.D.	PIN SIZE	O.D.	PIN SIZE
.250	.020 (.060-.0799)	3/8	.020 (.062-.1149)
.250	.030 (OVER .080)	3/8	.040 (OVER .115)
.375	.040	1/2	.060
.500	.060	5/8	.060
.625	.060	3/4	.090
.750	.090	7/8	.090
.875	.090	1.000	.090
1.000	.090	1.250	.120

TONS OF PRESSURE REQUIRED FOR PUNCHING MILD STEEL

This table below shows the tons of pressure required for single mild steel derived by the formula: Tons of pressure required = hole size x material thickness x constant 80. All figures shown are tons or percentages of tons. For intermediate sizes interpolations can be made.
By use of this chart, the tons of pressure required for multiple punching can also be figured.

Example: Can eight holes 1/8" round and two holes 3/16" round be punched in 16 gauge material on a 10 ton press? Yes.
Tons pressure requires for one hole 1/8" round in 16 ga. = .60 tons.
Tons of pressure requires for one hole 3/16" round in 16 ga. = .90 tons.
8 holes x .60 tons = 4.80
2 holes x .90 tons + 1.80
6.60 tons

Tons of pressure for punch sizes over 1" round can also be computed
Example: What pressure is required to punch a 2-1/4" round hold in 7/8" thick material? Since a 1" round hole in 7/8" thick material requires 70 tons pressure, a 2-1/4" round hole in 7/8" thick material requires 157.50 tons.

STOCK THICKNESS		PUNCH SIZE														
		1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1"
26 ga.	.0179	.18	.27	.36	.45	.54	.63	.72	.81	.90	.99	1.07	1.16	1.25	1.34	1.43
24 ga.	.0239	.24	.36	.48	.60	.72	.84	.96	1.08	1.20	1.31	1.43	1.55	1.67	1.89	1.91
22 ga.	.0299	.30	.45	.60	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.24	2.39
20 ga.	.0359	.36	.54	.72	.90	1.08	1.26	1.44	1.62	1.80	1.98	2.15	2.33	2.51	2.69	2.87
18 ga.	.0478	.48	.72	.96	1.20	1.43	1.67	1.91	2.15	2.39	2.63	2.87	3.11	3.34	3.58	3.82
16 ga.	.0598	.60	.90	1.20	1.50	1.79	2.09	2.39	2.69	2.99	3.29	3.59	3.89	4.19	4.49	4.78
14 ga.	.0747	.75	1.12	1.49	1.87	2.24	2.61	2.99	3.36	3.73	4.11	4.48	4.86	5.23	5.60	5.97
12 ga.	.1046	1.05	1.57	2.09	2.62	3.14	3.66	4.18	4.71	5.23	5.75	6.28	6.80	7.32	7.85	8.57
10 ga.	.1345	1.34	2.02	2.69	3.36	4.04	4.71	5.38	6.05	6.73	7.40	8.07	8.74	9.42	10.09	10.76
3/16	.187	1.87	2.81	3.74	4.68	5.61	6.55	7.48	8.42	9.35	10.29	11.22	12.16	13.09	14.03	14.96
1/4	.250	2.50	3.75	5.00	6.25	7.50	8.75	10.00	11.25	12.50	13.75	15.00	16.25	17.50	18.75	20.00
3/8	.375		5.62	7.50	9.37	11.25	13.13	15.00	16.88	18.75	20.63	22.50	24.38	26.25	28.13	30.00
1/2	.500			10.00	12.50	15.00	17.50	20.00	22.50	25.00	27.50	30.00	32.50	35.00	37.50	40.00
5/8	.625				15.62	18.75	21.87	25.00	28.12	31.25	34.38	37.50	40.63	43.75	46.88	50.00
3/4	.750					22.50	26.25	30.00	33.75	37.50	41.25	45.00	48.75	52.50	56.25	60.00
7/8	.875						30.62	35.00	39.37	43.75	48.12	52.50	56.84	61.25	65.63	70.00
1"	1.000							40.00	44.96	50.00	54.96	60.00	64.96	70.00	74.96	80.00

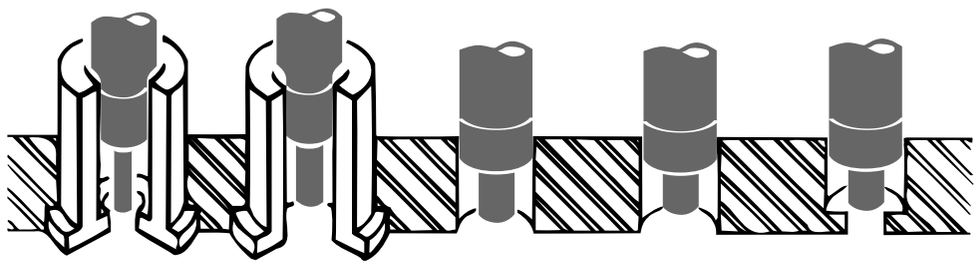
Pressures above are reduced by shear on punch end or staggering punches.

Ratio holes requiring Pivot Whipsleeve type punches

WHEN ORDERING WHIPSLEEVE PUNCHES:

1. Use shortest possible point length for added strength on critical punches.
2. Use largest practical size shank in relation to point diameter
3. Use maximum punch and die clearance wherever possible.
4. Consider hardness as well as thickness of material to be punched in relation to point diameter. (in most cases, the XS punch will penetrate thickness as much as twice the diameter of the punch – replacing many drilling operations.)
5. Provide depth stop so that punches cannot set too deep
6. Provide taper on die sections or die buttons all the way through
7. Provide taper slug clearance in die shoe

WHEN GUIDING IN STRIPPER BUSHING
Make certain the shipsleeve is an easy slipfit in the guide bushing. When guiding in the stripper itself itself use 4140 steel or equivalent, hardness approx. 300 Brinell, heat treated before machining. Be sure shipsleeve is engaged in guide before punch contacts material.
Pivot Punches are supplied without guides. Use ACS Stripper Guide Bushings. (See Selective Series Catalog Page 16), Standard Drill Bushings, or the type of guide that will give the punch the proper support for the particular application. Examples are shown.



ACS TWO STEP STRIPPER GUIDE
Guide on shank
Clearance on point

STRIPPER GUIDE
Guide on shank.

PUNCH GUIDED IN STRIPPER

CLEARANCE HOLE IN STRIPPER
No guide

COUNTER BORED HOLE IN STRIPPER
No guide

KEY UNIVERSAL NUMBERING

POSITION ONE - SERIES

	DESCRIPTION
19	Other - Inch
10	Basic - Inch - Steel
11	Variable - Inch - Steel
12	Light Duty Ball Lock - Inch - Steel
13	Heavy Duty Ball Lock - Inch - Steel
20	Basic Machinable Head - Carbide
21	Precision Machinable Head - Carbide
30	Basic Step-A-Head - Carbide
31	Precision Step-A-Head - Carbide
40	Basic With Sleeve - Carbide
41	Precision With Sleeve - Carbide
59	Other - Metric
50	Basic - Metric - Steel
51	Variable - Metric - Steel
52	Light Duty Ball Lock - Metric - Steel
53	Heavy Duty Ball Lock - Metric - Steel
61	Precision Machinable Head - Metric - Carbide

POSITION TWO - TYPE

	DESCRIPTION
01	Solid Punch
02	Ejector Punch
03	Wire Punches (Basic Only)
04	Angle Head Punches
05	Combination Angle Head Punches
06	Cylindrical Head Punches
07	Air Hole Punch
08	Solid Center Dowel Punch
09	Ejector Center Dowel Punch
21	Angle Head Punch Holder
22	Combination Angle Head Punch Holder
23	Cylindrical Head Punch Holder
31	Headless Punch Guide Bushing
32	Head Down Punch Guide Bushing
33	Head Up Punch Guide Bushing

POSITION TWO - (CONT'D)

	DESCRIPTION
41	Headless Press Fit Die Button
42	Headed Press Fit Die Button
43	Ball Lock Die Button
51	Headless Precision Press Fit Die Button
52	Headed Precision Press Fit Die Button
53	Headless Precision Press Fit Die Button - Full Taper
54	Headed Precision Press Fit Die Button - Full Taper
55	Headless Precision Press Fit Die Button - Split Type
61	Retainers
62	Backing Hole
71	Ball Lock Punch & Die Button Gage
72	Ball Lock Punch & Die Button Gage Check Master
73	Ball Lock Retainer Gage
91	Lite Duty Urethane Stripper - Tube
92	Medium Duty Urethane Stripper - Tube
93	Heavy Duty Urethane Stripper - Tube
94	Extra Heavy Duty Urethane Stripper - Tube
95	Lite Duty Urethane Stripper - Closed End
96	Medium Duty Urethane Stripper - Closed End
97	Heavy Duty Urethane Stripper - Closed End
98	Extra Heavy Duty Urethane Stripper - Closed End

POSITION THREE - CONFIGURATION

	DESCRIPTION
01	Round
02	Rectangle
03	Obround
04	Square
05	End
06	Universal
07	Pilot - Parabolic
08	Pilot - Long Nose
09	Blank
10	Round Straight Punch
11	EDM Die Button Blank - Drilled Wire Hole
12	EDM Die Button Blank - Ground Wire Hole

POSITION ONE	POSITION TWO	POSITION THREE	BODY DIAMETER	OVERALL LENGTH	POINT LENGTH	SHAPE SIZE	SPECIFY MATERIAL
10 Basic	**01 Solid Punch**	**03 Obround**	**037 3/8**	**250 2-1/2”**	**062 5/8**	**.312x.250**	**M-2**

The performance people at Pivot Punch Corporation have been supplying high quality tooling to the stamping industry since 1961. Over the years, Pivot has earned the highest reputation for excellence in the manufacturing of standard punches, die buttons, drawing details, and components used in the stamping and forming industry. We utilize over 56,000 square feet of our modern manufacturing facility in order to produce the most precision products competitively priced and always shipped as scheduled. Our commitment to quality and value is enhanced with the acquisition of CNC equipment to extend effective cost controls and improve manufacturing capabilities. Pivot has invested in the following CNC or computer systems: CNC Shape Grinder CNC Form Dressing Systems CNC Machining Centers CNC Turning Centers CNC Vacuum Furnaces CNC Wire EDM CNC Internal Grinders CNC Milling Machines. Our plant is operated and managed with the latest bar coded system available. Our million dollar inventory is ready to service your immediate requirements. You may e-mail us at sales@pivotpunch.com for your drawings and other data. preferred file formats are Autocad, DWG or DFX.

On the Cutting Edge of Industry

6550 Campbell Blvd.
Lockport, New York 14094
Phone: (716) 625-8000
Toll-free fax: 1-800-622-3227
E-Mail: sales@pivotpunch.com

Cleveland, Ohio
5121 West 161st St
Brook Park, Ohio 44142
Phone: (216) 362-1990
Fax: (216) 362-1993

pivot punch corporation