WILSON TOOL

ISO 9001*

IMPAX TOOLING SOLUTIONS

TOOLING SOLUTIONS
FOR THE STAMPING INDUSTRY

2024

HOW TO USE THE CATALOG

1. Find the style code.
2. Select head thickness.
3. Find the shank dia. box for the punch you are ordering. Shank code is listed in blue.
4. Select the overall length.
5. Select the point length.
6. Select the shape and indicate the size of the punch tip within this range (*Absolute Min. P/W additional charge.)

	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 1.25	1.50	1.75	2.00	2.25	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	5.75	6.00	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
SOLID	ISP	.125=B or .188=V	.125 012																					.50=2	.03	.03	.125
																								.75=3	.04	.06	
																								1.00=4			
																								1.25=5	.06	.09	
		.125=B or .188=V	.250 025	4	4	4	4	4	4	4	4	4	4	4	4									.50=2	.04	.06	.25
					4	4	4	4	4	4	4	4	4	4	4									.75=3			
						4	4	4	4	4	4	4	4	4	4									1.00=4			
							4	4	4	4	4	4	4	4	4									1.25=5	.06	.09	
								4	4	4	4	4	4	4	4									1.50=6	.09	.10	
		*.250=B or .188=V	.500 050	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3	.09	.13	.5
					4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
						4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5			
							4	4	4	4	4	4	4	4	4	4	4	4	4					1.50=6	.12	.13	
	Overall Length [L] Code			125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600				

Stock available 4 Ultima® M4 steel available *Not stocked in Ultima® M4 steel

7. Choose tip tolerance.

OPTIONAL TIP TOLERANCE [P]		
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.	**#1 SHAPES** ±.0005 Point to Shank Concentric within .001 T.I.R.	**#2 ROUNDS & SHAPES** +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified		

8. Choose key type (if applicable). See Keying Information on pages 118-119.

9. Indicate type of material if other than M2. See Tool Steels on page 6.

ORDER EXAMPLE

ROUND

STYLE ISP | HEAD THICKNESS V | SHANK 037 | OVERALL LENGTH 300 | POINT LENGTH 'B' 3 | SHAPE RD | 'P' DIM P=.250 | COATING Optima

SHAPE

STYLE ISP | HEAD THICKNESS V | SHANK 050 | OVERALL LENGTH 275 | POINT LENGTH 'B' 5 | SHAPE OB | 'P' DIM P=.400 | 'W' DIM W=.200 | KEY STYLE K1 | KEY ANGLE Y90

TABLE OF CONTENTS

ABOUT WILSON TOOL INTERNATIONAL

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

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

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

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

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

BENDING

Wilson Tool's Bending division delivers the most complete line of tooling and clamping solutions available anywhere.

Whether you use American, European, WT or LVD-style precision or conventional tooling, Wilson Tool has a solution for you. Our clamping options cover these styles as well. With hydraulic push button, quick release mechanical or standard manual clamps, we have a clamping solution for any style of machine or budget. And our custom tooling manufacturing capabilities are the envy of the industry with innovative solutions for complex bending challenges. With manufacturing facilities located in the USA and Canada, our delivery times to North American fabricators are the fastest in the industry.

STAMPING

Wilson Tool's Stamping division, Impax Tooling Solutions®, offers high quality punch and die components, accessories and retainers for the stamping industry.

Innovative products such as our HP Accu-Lock® Retainer Inserts and extensive coating options, combined with our world-class customer service, have enabled us to quickly grow into a world-class provider. With a direct sales force throughout North America, we deliver products straight from the factory to you, enabling the fastest deliveries in the industry. Our custom tooling expertise is second to none with many customers coming to us for their most difficult stamping challenges.

PUNCHING

Wilson Tool's Punching division continues to drive the industry with new levels of quality, delivery, service and innovation.

From the early days of Series 80 to the Wilson Wheel® Family to EXP® technology, our punching division has been the industry-leading innovation driver. Combined with the most experienced customer support professionals in the industry, Wilson Tool continues to raise the bar. Thick turret, TRUMPF-style, Salvagnini-style, or any other style of punch press you may be using, Wilson Tool offers the most complete line of tooling solutions available today.

TRUMPF is a trademark of TRUMPF GmbH + Co. KG.

ACCESSORIES

Whether you need storage systems, grinders, urethane, hand tools or related supplies, we offer a wide range of solutions to help you be more productive, organized and efficient.

PUT THE RIGHT TOOL STEEL TO WORK FOR YOU

Ever wonder which tool steel is the best for your application? Tool steels aren't all the same and that's why we use a wide range to meet the needs of virtually every application. Punches and dies from Impax Tooling Solutions®, a division of Wilson Tool International, are crafted from high alloy content steels specifically designed to stamp materials at high speeds and resist extreme heat generated at the tool's cutting edge. Beyond that, the makeup of tool steels varies significantly in hardness, wear resistance and toughness. To determine the right steel for your application, see below or contact us today.

M2

M2 is a conventional high-speed steel, hardened and triple tempered to HRC:60-63. It has good toughness, wear resistance and high compression strength.

PM-M4

When the toughness and wear resistance properties of M2 steel aren't enough, we offer an upgrade to PM-M4 tool steel. A particle metallurgy high-speed steel, PM-M4 is hardened and triple tempered to HRC: 62-64, which makes it a better steel for applications that require more toughness, wear resistance and compression strength.

Ultima® M4

If you are looking for a tool steel that is even tougher than PM-M4, Ultima M4 is the best combination of toughness and wear resistance and though it can be used for any job, is specifically designed for high tensile strength applications or for those using abrasive materials. Applications using Ultima M4 result in significantly reduced tool micro chipping, and substantial reductions in downtime and retooling costs due to less frequent tool replacement. In comparison with other steels, Ultima M4 shows 11% more toughness and 25% more wear resistance over PM-M4, and it provides an 86% increase in toughness and 64% more wear resistance over standard M2 steel.

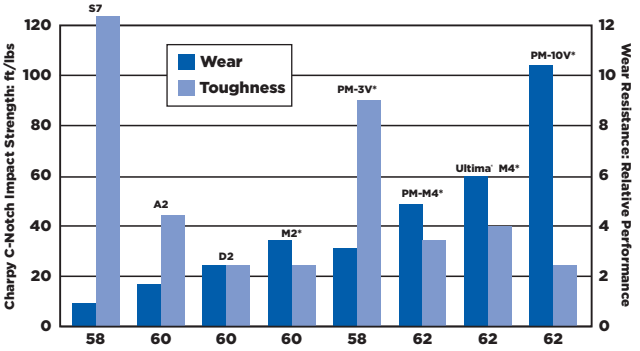
Scan QR Code to Explore Tool Steels

PM-10V

PM-10V steel is the most wear resistant steel we offer. It's hardened and triple tempered to HRC:62-64. Stampers who are successful with M2, but need additional tool life, are prime candidates for PM-10V.

PM-3V

We recommend PM-3V tool steel for the highest level of impact resistance, which has relatively good wear resistance and compressive strength. PM-3V is well suited to stampers who experience chipping and breakage problems with other types of steel such as stainless, HSLA or spring steel, or if the design requires you to pierce material thicknesses that are similar to your hole diameter.



*Readily available from Wilson Tool. Other tool steels available upon request.

Visit **wilsontool.com/MyAccount** for 24/7 Online Access
Quotes, Orders, Drawings, Invoices, Tracking Numbers & More!

COATINGS FOR ULTIMATE PUNCH LIFE

Coating technology can boost tooling performance to levels far beyond that of untreated tool steels. As a leader in coating innovations, we continually work to develop solutions that increase tool life, lubricity and surface hardness — improving productivity and up time. Optima® was our first proprietary coating developed in our state-of-the-art coating facility and it has set the industry standard for many years. Today, we continue to offer you the very latest in coating solutions.

Optima® 	Our most popular coating for piercing, blanking and trimming in a variety of applications.	• Increased wear resistance • Improved surface finish • Greater resistance to corner breakdown • Much harder than traditional TiCN
Wearbeater 	Our first and original PVD coating. Commonly used for piercing, blanking and forming applications in softer materials such as mild steel, galvanized and aluminum.	• Reduced galling • Increased tool life by at least 3–7 times over non-coated punches • Increased hardness and lubricity • Bright gold for easier visual identification
TiAlN (AlTiN) 	Performs best in high-heat applications such as stainless, high strength steel or ultra-high strength steels. At higher surface temperatures aluminum oxide is formed, enhancing the coating's performance.	• Exceptionally hard coating • Not recommended for aluminum
AlCrN 	A chromium composition results in a much tougher coating with added wear resistance. Well-suited for high impact applications.	• Improved wear resistance • Not recommended for aluminum
TiZrN 	Typical applications include piercing and forming of non-ferrous materials, including aluminum, copper and brass.	• Improved wear resistance • Added toughness
TiCrN 	A nano layer coating that is suitable for piercing and especially for high pressure forming applications.	• Very high hardness • Low friction resulting in galling resistance
CrN 	Performs well in high heat and corrosive applications with improved performance and reduced wear.	• Improved wear resistance • High heat resistance • Increased chemical resistance
Forte® 	Our proprietary multi-layer nano coating is a great alternative to a chemical vapor deposition (CVD) coating. A lower application temperature retains original dimensions. Good for high-pressure applications and punching and forming for high and low alloy steel in all thicknesses.	• Reduced tooling downtimes • Superior punch wear and edge breakdown performance • Polished steels retain full surface quality • Reduced galling • Excellent coating adhesion
Slip-Max® 	This low friction, multi-layer coating transitions from PVD to PACVD uniformly in the same batch, creating excellent adhesion amongst the layers as well as to the substrate material.	• Increased wear resistance • Greatly reduced material adhesion • Low friction, improved lubricity • Better material flow for forming • Excellent coating adhesion

SURFACE ENHANCEMENTS

Increase Part Quality While Adding Tool Life

The Impax Tooling Solutions® division of Wilson Tool International has an expanded line of surface finishes to provide stampers with an array of options to increase punch life and improve your stamping performance. By improving stripping pressures and reducing galling, our surface finishes not only increase punch life, they result in a cleaner punch with more accurate hole diameters.

- **Standard Finish**

  Every punch we produce is finished with Wilson Tool's standard finish. This is our basic ground finish. It is a conventional radial grind with a finish measuring 8–10 Ra for reduced galling, increased wear resistance and longer punch life.

- **PinPoint™ Straight Line Grind**

  Wilson Tool's PinPoint straight line grind is the ultimate finish for high quality stamping. Available on any style of punch, the finish is produced by precision grinding in parallel with the centerline of the tool and then indexing the punch in millionth increments to achieve the required shape. It also improves the lubrication-retaining characteristics of the tip and reduces the stripping force required.

- **SheerPerfection™ Polish**

  Available alone or in combination with any of our other surface finishes, our SheerPerfection polish will improve the finish of any punch by up to 4 Ra. It's an ideal solution for forming applications to prevent marring resulting from running metal against metal. Couple this finish with any of our coatings for a punch that will be the ultimate in resisting material adhesion. SheerPerfection polish is also available on extrusion dies and other internal features.

Improve Your Stamping Performance

Longer punch life and unmatched accuracy resulting from Wilson Tool surface finishes will increase your productivity and improve the quality of your parts. Call 800-944-4671 or visit **wilsontool.com/stamping** today to learn more.

GUARANTEED TO OUTPERFORM

With our consultative approach and industry-leading tooling performance, we guarantee we will outperform your current tooling.

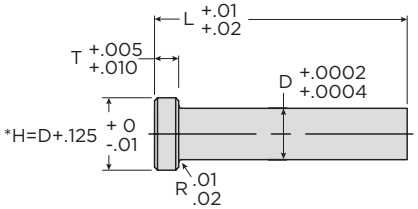
Since our inception, Wilson Tool has remained steadfast in our commitment to our customers' success. We collaborate closely with each customer, leveraging our decades of expertise to provide world-class tooling solutions tailored to your unique needs. With Wilson Tool, you're not just receiving tools – you're gaining a partner dedicated to your productivity.

READY TO GIVE US A CHANCE?

Visit **wilsontool.com/stamping**, call our tooling technicians at 800-944-4671 or contact your local sales engineer.

SOLID BLANKS

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4



Punch Head drawn to 40-50 HRC up to 1" dia.

*H=Head Diameter

ORDER

STYLE — SHANK — SHAPE

ISP V 037 - 250 BL

HEAD THICKNESS — OVERALL LENGTH

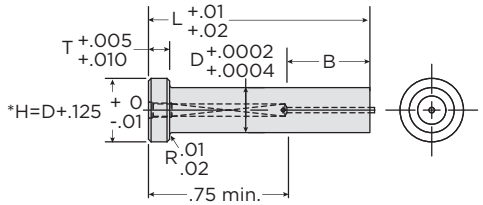
SOLID

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L]																			
			1.25	1.50	1.75	2.00	2.25	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	5.75	6.00
ISP	.125=B or .188=V	.125 012																				
	.125=B or .188=V	.1875 018	4	4	4	4	4	4	4	4	4	4	4	4								
	.125=B or .188=V	.250 025	4	4	4	4	4	4	4	4	4	4	4	4								
	.125=B or .188=V	.3125 031	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				
	.188=V	.375 037	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				
	.188=V	.4375 043	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				
	*.250=B or .188=V	.500 050	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				
	.250=B or .188=V	.625 062					4	4	4	4	4	4	4	4	4	4	4	4				
	.250=B or .188=V	.750 075		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				
	.250=B or .188=V	.875 087		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				
	.250=B or .188=V	1.00 100		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				
	.250=B or .188=V	1.25 125																				
	.250=B or .188=V	1.50 150																				
	.250=B or .188=V	1.75 175																				
	.125=B or .188=V	2.00 200																				
	.250=B or .188=V	2.25 225																				
	.250=B or .188=V	2.50 250																				
	Overall Length [L] Code		125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600

Stock available 4 Ultima® M4 steel available *Not stocked in Ultima® M4 steel

EJECTOR BLANKS

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4



Punch Head drawn to 40-50 HRC up to 1" dia.

*H=Head Diameter

EJECTOR COMPONENTS						
Size	.020	.032	.046	.063	.094	.125
Part #	EJ2	EJ3	EJ4	EJ6	EJ9	EJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

For additional Ejector Components, see page 116.

ORDER

STYLE / SHANK / SIDE HOLE LOCATION

IEP B 062 - 300 4 BL

HEAD THICKNESS / OVERALL LENGTH / SHAPE

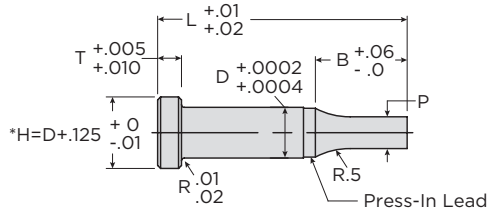
EJECTOR	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	Side Hole Location [B]	Ejector
	IEP	.125=B or .188=V	.1875 018	4	4	4	4	4	4	4	4													.50=2 .75=3 1.00=4 1.25=5 1.50=6	2 (.02)
		.125=B or .188=V	.250 025	4	4	4	4	4	4	4	4														3 (.032)
		.125=B or .188=V	.3125 031	4	4	4	4	4	4	4	4	4	4	4	4										4 (.046)
		.188=V	.375 037	4	4	4	4	4	4	4	4	4	4	4	4										6 (.063)
		.188=V	.4375 043		4	4	4	4	4	4	4	4	4	4	4										6 (.063)
		.188=V	.500 050		4	4	4	4	4	4	4	4	4	4	4										6 (.063)
		.250=B or .188=V	.625 062		4	4	4	4	4	4	4	4	4	4	4										9 (.094)
		.250=B or .188=V	.750 075		4	4	4	4	4	4	4	4	4	4	4										9 (.094)
		.250=B or .188=V	.875 087		4	4	4	4	4	4	4	4	4	4	4										9 (.094)
		.250=B or .188=V	1.00 100		4	4	4	4	4	4	4	4	4	4	4										9 (.094)
		.250=B or .188=V	1.25 125																						12 (.125)
		.250=B or .188=V	1.50 150																						12 (.125)
		.250=B or .188=V	1.75 175																						12 (.125)
		.125=B or .188=V	2.00 200																						12 (.125)
		.250=B or .188=V	2.25 225																						12 (.125)
		.250=B or .188=V	2.50 250																						12 (.125)
		Overall Length [L] Code		125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600		

Stock available 4 Ultima® M4 steel available

HEADED

SOLID PUNCH

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4



Punch Head drawn to 40-50 HRC

*H=Head Diameter

ALTERATION OPTIONS

AH Altered head diameter
PL Precision overall Length ±.001"
PT Precision head thickness ±.0005"
For additional Alteration Options, see page 114.

OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS
+.0005
- 0
Point to Shank Concentric within .0005 T.I.R.

#1 SHAPES
±.0005
Point to Shank Concentric within .001 T.I.R.

#2 ROUNDS & SHAPES
+.0002
- 0
Point to Shank Concentric within .0003 T.I.R.

Tolerance #1 unless specified

ORDER

ROUND

STYLE / SHANK / POINT LENGTH 'B' / 'P' DIM

ISP V 037 - 300 3 RD P=.250 Optima

HEAD THICKNESS / OVERALL LENGTH / SHAPE / COATING

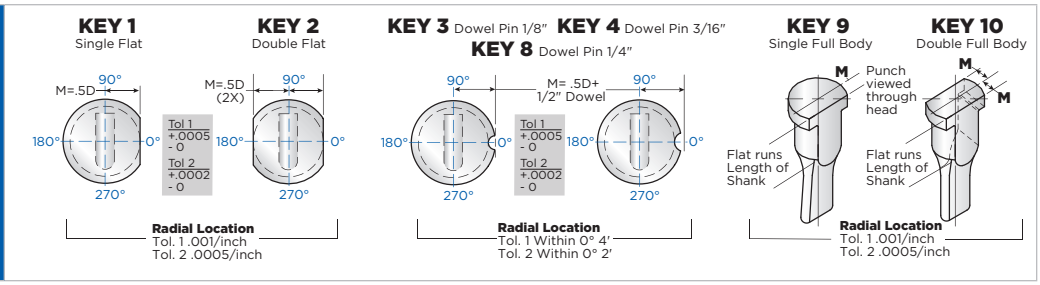
SHAPE

STYLE / SHANK / POINT LENGTH 'B' / 'P' DIM / KEY STYLE

ISP V 050 - 275 5 OB P=.400 W=.200 K1 Y90

HEAD THICKNESS / OVERALL LENGTH / SHAPE / 'W' DIM / KEY ANGLE

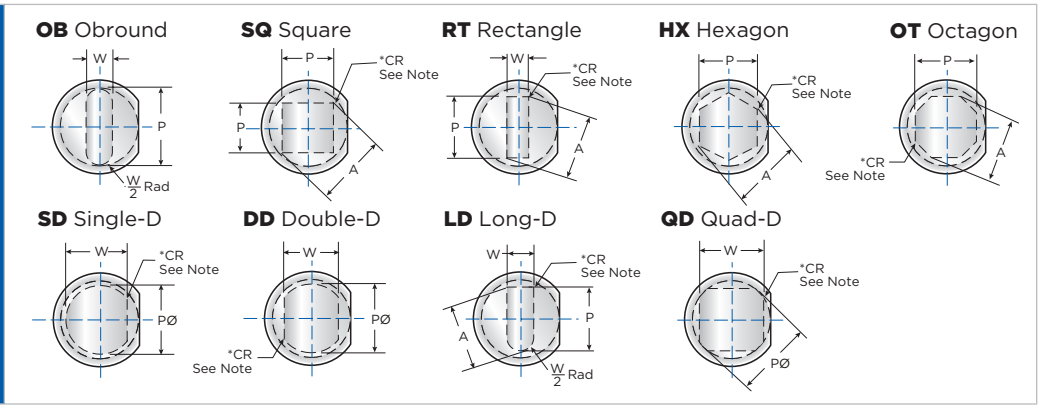
KEYS



NOTES

- **Key 1-4 & 8** included in all standard shapes price.
- Standard 'M' dim. for **Key 9 & 10** is .5D Dia.-.060.
- Alterations to keying, see page 118.
- Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES

Order Die View.

* .005 radius corners typical on shapes.

For special shapes see page 107.

HEADED

SOLID PUNCH

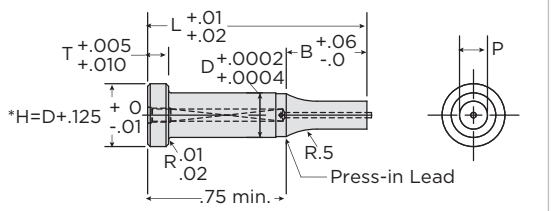
Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
SOLID ISP	.125=B or .188=V	.125 012																					.50=2	.03	.03	.125
																							.75=3	.04	.06	
																							1.00=4			
																							1.25=5	.06	.09	
	.125=B or .188=V	.1875 018	4	4	4	4	4	4	4	4	4	4	4	4									.50=2	.04	.06	.1875
				4	4	4	4	4	4	4	4	4	4	4									.75=3			
					4	4	4	4	4	4	4	4	4	4									1.00=4			
						4	4	4	4	4	4	4	4	4									1.25=5	.06	.09	
							4	4	4	4	4	4	4	4									1.50=6	.09	.10	
	.125=B or .188=V	.250 025	4	4	4	4	4	4	4	4	4	4	4	4									.50=2	.04	.06	.25
				4	4	4	4	4	4	4	4	4	4	4									.75=3			
					4	4	4	4	4	4	4	4	4	4									1.00=4			
						4	4	4	4	4	4	4	4	4									1.25=5	.06	.09	
							4	4	4	4	4	4	4	4									1.50=6	.09	.10	
	.125=B or .188=V	.3125 031	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.06	.09	.3125
				4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3			
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5	.09	.1	
							4	4	4	4	4	4	4	4	4	4	4	4					1.50=6			
	.188=V	.375 037	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.06	.09	.375
				4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3			
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5	.09	.1	
							4	4	4	4	4	4	4	4	4	4	4	4					1.50=6			
	.188=V	.4375 043	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3	.09	.13	.4375
				4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.50=6	.12	.13	
	*.250=B or .188=V	.500 050	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3	.09	.13	.5
				4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.50=6	.12	.13	
	.250=B or .188=V	.625 062					4	4	4	4	4	4	4	4	4	4	4	4					.75=3	.18	.2	.625
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5			
							4	4	4	4	4	4	4	4	4	4	4	4					1.50=6	.23	.25	
	.250=B or .188=V	.750 075		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3	.18	.2	.75
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5			
							4	4	4	4	4	4	4	4	4	4	4	4					1.50=6	.23	.25	
	.250=B or .188=V	.875 087		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3	.18	.2	.875
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5			
							4	4	4	4	4	4	4	4	4	4	4	4					1.50=6	.23	.25	
	.250=B or .188=V	1.00 100		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3	.21	.25	1
					4	4	4	4	4	4	4	4	4	4	4	4	4	4					1.00=4			
						4	4	4	4	4	4	4	4	4	4	4	4	4					1.25=5			
							4	4	4	4	4	4	4	4	4	4	4	4					1.50=6	.3	.312	
Overall Length [L] Code			125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600				

Stock available 4 Ultima® M4 steel available *Not stocked in Ultima® M4 steel

HEADED

EJECTOR PUNCH

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4



Punch Head drawn to 40-50 HRC

*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES ±.0005 Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

EJECTOR COMPONENTS

Size	.020	.032	.046	.063	.094	.125
Part #	EJ2	EJ3	EJ4	EJ6	EJ9	EJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

For additional Ejector Components, see page 116.

ALTERATION OPTIONS

AE Ejector size — different than standard for punch
AH Altered head diameter
NS No side hole — ejector
PL Precision Overall Length ±.001"
PT Precision head thickness ±.0005"
For additional Alteration Options, see page 114.

ORDER

ROUND

STYLE / SHANK / POINT LENGTH 'B' / 'P' DIM / COATING

IEP V 037 - 300 3 RD P=.250 TOL2 Optima

HEAD THICKNESS / OVERALL LENGTH / SHAPE / TOLERANCE

SHAPE

STYLE / SHANK / POINT LENGTH 'B' / 'P' DIM / KEY ANGLE

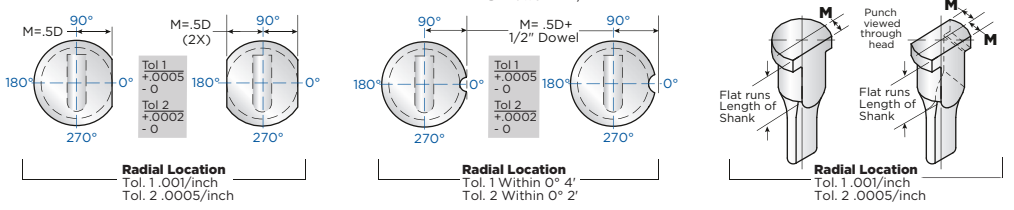
IEP B 062 - 350 4 SQ P=.250 K3 Y45

HEAD THICKNESS / OVERALL LENGTH / SHAPE / KEY STYLE

EASY SHARP TOOL

SIZE	CAT. NO.	FITS PIN NO.
.061	971481	4, 6, 9, 12
.031	971482	2, 3
Set	971562	

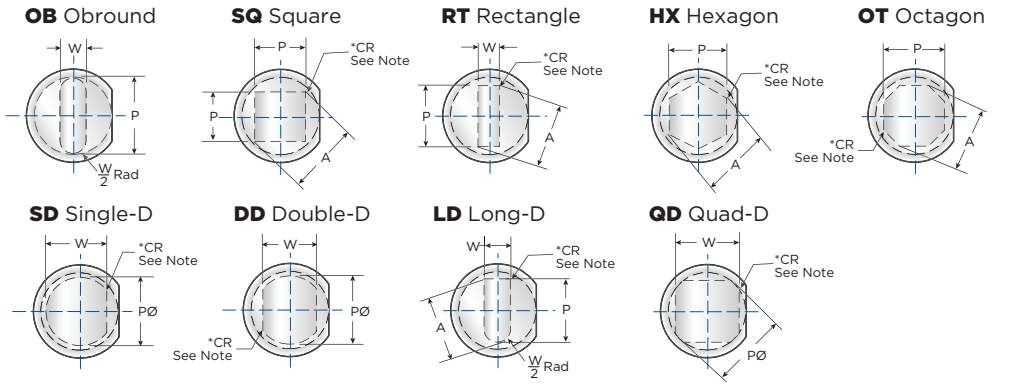
KEYS



NOTES

- **Key 1-4 & 8** included in all standard shapes price.
- Standard 'M' dim. for **Key 9 & 10** is .5D Dia. -.060.
- Alterations to keying, see page 118.
- Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES

Order Die View.

*.005 radius corners typical on shapes.

For special shapes see page 107.

EJECTOR PUNCH

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L]																				Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A	Ejector
			1.25	1.50	1.75	2.00	2.25	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	5.75	6.00					
EJECTOR																											
IEP	.125=B or .188=V	.1875 018	④	④	④	④	④	④	④	④													.50=2	.05	.06	.125	2 (.02)
				④	④	④	④	④	④	④													.75=3				
					④	④	④	④	④	④													1.00=4	.058	.06		
	.125=B or .188=V	.250 025	④	④	④	④	④	④	④	④													.50=2	.08	.09	.25	3 (.032)
				④	④	④	④	④	④	④													.75=3				
					④	④	④	④	④	④													1.00=4				
						④	④	④	④	④													1.25=5				
	.125=B or .188=V	.3125 031	④	④	④	④	④	④	④	④	④	④	④	④									.50=2	.115	.12	.3125	4 (.046)
				④	④	④	④	④	④	④	④	④	④	④									.75=3				
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
	.188=V	.375 037	④	④	④	④	④	④	④	④	④	④	④	④									.50=2	.158	.165	.375	6 (.063)
				④	④	④	④	④	④	④	④	④	④	④									.75=3				
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
	.188=V	.4375 043		④	④	④	④	④	④	④	④	④	④	④									.75=3	.158	.165	.4375	6 (.063)
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
	.188=V	.500 050		④	④	④	④	④	④	④	④	④	④	④									.75=3	.158	.165	.5	6 (.063)
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
	.250=B or .188=V	.625 062		④	④	④	④	④	④	④	④	④	④	④									.75=3	.235	.25	.625	9 (.094)
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
	.250=B or .188=V	.750 075		④	④	④	④	④	④	④	④	④	④	④									.75=3	.235	.25	.75	9 (.094)
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
	.250=B or .188=V	.875 087		④	④	④	④	④	④	④	④	④	④	④									.75=3	.235	.25	.875	9 (.094)
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
	.250=B or .188=V	1.00 100		④	④	④	④	④	④	④	④	④	④	④									.75=3	.235	.312	1	9 (.094)
					④	④	④	④	④	④	④	④	④	④									1.00=4				
						④	④	④	④	④	④	④	④	④									1.25=5				
							④	④	④	④	④	④	④	④									1.50=6				
Overall Length [L] Code			125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600					

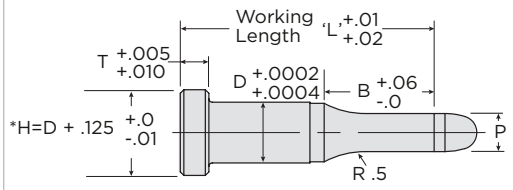
Stock available ④ Ultima® M4 steel available

HEADED

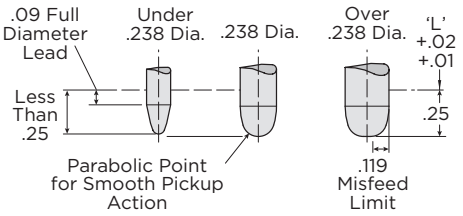
PILOT PUNCH

STANDARD MATERIAL M2 60-63 HRC — ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4

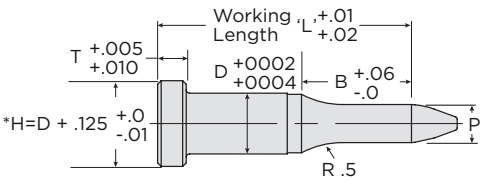
STYLE P1 PARABOLIC PILOT



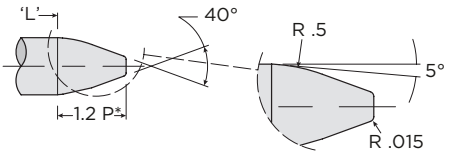
*H=Head Diameter



STYLE P2 ANGULAR PILOT NOTES



*H=Head Diameter



*1.2 x dia. for .187 dia. or larger
1.5 x dia. for under .187 dia.

OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS
+.0005
- 0
Point to Shank Concentric within .0005 T.I.R.

#2 ROUNDS
+.0002
- 0
Point to Shank Concentric within .0003 T.I.R.

Note: Shaped pilot punches available.

P1

P2

ALTERATION OPTIONS

ABR	Blend radius other than .500" [Round only]
ABRD	Point length longer than standard lengths [Round only]
AD	Reduce body diameter
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
PT	Precision head thickness ±.0005"

For additional Alteration Options, see page 114.

ORDER ROUND

STYLE	SHANK	POINT LENGTH 'B'		'P' DIM	
ISP	B	062 - 350	4	RD	P=.500 P1
	HEAD THICKNESS		WORKING LENGTH	SHAPE	PILOT STYLE

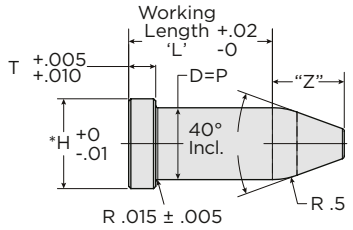
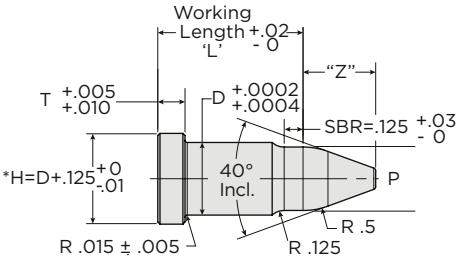
PILOT PUNCH

Style Code	Head THK [T]	Shank Dia. [D]	Working Length [L]																					Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
			1.25	1.50	1.75	2.00	2.25	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	5.75	6.00					
PILOT ISP	.125=B or .188=V	.125 012																						.50=2	.03	.03	.125
																								.75=3	.04	.06	
																								1.00=4			
																								1.25=5	.06	.09	
	.125=B or .188=V	.1875 018	④	④	④	④	④	④	④	④	④	④												.50=2	.04	.06	.1875
				④	④	④	④	④	④	④	④	④												.75=3			
					④	④	④	④	④	④	④	④												1.00=4			
						④	④	④	④	④	④	④												1.25=5	.06	.09	
							④	④	④	④	④	④												1.50=6	.09	.10	
	.125=B or .188=V	.250 025	④	④	④	④	④	④	④	④	④	④												.50=2	.04	.06	.25
				④	④	④	④	④	④	④	④	④												.75=3			
					④	④	④	④	④	④	④	④												1.00=4			
						④	④	④	④	④	④	④												1.25=5	.06	.09	
							④	④	④	④	④	④												1.50=6	.09	.10	
	.125=B or .188=V	.3125 031	④	④	④	④	④	④	④	④	④	④	④	④	④	④								.50=2	.06	.09	.3125
				④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3			
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5	.09	.1	
							④	④	④	④	④	④	④	④	④	④								1.50=6			
	.188=V	.375 037	④	④	④	④	④	④	④	④	④	④	④	④	④	④								.50=2	.06	.09	.375
				④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3			
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5	.09	.1	
							④	④	④	④	④	④	④	④	④	④								1.50=6			
	.188=V	.4375 043		④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3	.09	.13	.4375
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5			
							④	④	④	④	④	④	④	④	④	④								1.50=6	.12	.13	
	*.250=B or .188=V	.500 050		④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3	.09	.13	.5
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5			
							④	④	④	④	④	④	④	④	④	④								1.50=6	.12	.13	
	.250=B or .188=V	.625 062		④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3	.18	.2	.625
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5			
							④	④	④	④	④	④	④	④	④	④								1.50=6	.23	.25	
	.250=B or .188=V	.750 075		④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3	.18	.2	.75
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5			
							④	④	④	④	④	④	④	④	④	④								1.50=6	.23	.25	
	.250=B or .188=V	.875 087		④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3	.18	.2	.875
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5			
							④	④	④	④	④	④	④	④	④	④								1.50=6	.23	.25	
	.250=B or .188=V	1.00 100		④	④	④	④	④	④	④	④	④	④	④	④	④								.75=3	.21	.25	1
					④	④	④	④	④	④	④	④	④	④	④	④								1.00=4			
						④	④	④	④	④	④	④	④	④	④	④								1.25=5			
							④	④	④	④	④	④	④	④	④	④								1.50=6	.3	.312	
Working Length [L] Code			125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600					

Stock available ④ Ultima® M4 steel available *Not stocked in Ultima® M4 steel

HEADED

STUBBY PILOT PUNCH

STANDARD MATERIAL M2 60-63 HRC ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4	
ISS STRAIGHT — P3	ISP POINT — P3
	

OPTIONAL TIP TOLERANCE [P]
TOLERANCE #1 +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
TOLERANCE #2 +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

*H=Head Diameter

ISS [P3]

ISP [P3]

ALTERATION OPTIONS	
ABR	Blend radius other than .500" [Round only]
ABRD	Point length longer than standard lengths [Round only]
AD	Reduce body diameter
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
PT	Precision head thickness ±.0005"

For additional Alteration Options, see page 114.

ORDER

STRAIGHT

STYLE	SHANK		SHAPE	PILOT STYLE
ISS	V	037 - 087	RD	D=.3430 P3
	HEAD THICKNESS	WORKING LENGTH		'D' DIM

POINT

STYLE	SHANK		SHAPE	PILOT STYLE
ISP	B	075 - 100	RD	P=.500 P3
	HEAD THICKNESS	WORKING LENGTH		'P' DIM

STUBBY PILOT PUNCH

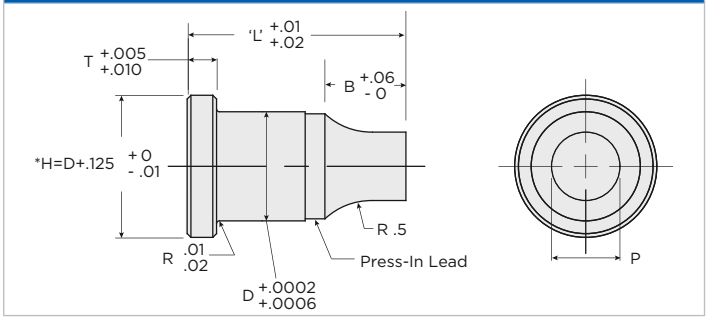
	Style Code	Head THK [T]	Shank Dia. [D]	Working Length [L]							[Z]	Min. D	Max. D	Head Diameter [H]
				0.625	0.750	0.875	1.000	1.125	1.250	1.375				
STRAIGHT	ISS	.125=B or .188=V	.250 025								.25	.1876	.25	.375
		.125=B or .188=V	.3125 031								.3125	.2501	.3125	.4375
		.188=V	.375 037								.375	.3126	.375	.500
		.188=V	.4375 043								.4375	.3751	.4375	.5625
		.188=V or .250=B	.500 050								.5	.4376	.5	.625
		.188=V or .250=B	.625 062								.625	.5001	.625	.750
		.188=V or .250=B	.750 075								.75	.6251	.75	.875
		.188=V or .250=B	.875 087								.875	.7501	.875	1.00
		.188=V or .250=B	1.00 100								1	.8751	1	1.125
		Working Length [L] Code		**062**	**075**	**087**	**100**	**112**	**125**	**137**				

	Style Code	Head THK [T]	Shank Dia. [D]	Working Length [L]							SBR	Max. Z	Min. P	Max. P
				0.625	0.750	0.875	1.000	1.125	1.250	1.375				
POINT	ISP	.125=B or .188=V	.250 025								.125	.25	.092	.2499
		.125=B or .188=V	.3125 031								.125	.3125	.092	.3124
		.188=V	.375 037								.125	.375	.092	.3749
		.188=V	.4375 043								.125	.4375	.092	.4374
		.188=V or .250=B	.500 050								.125	.5	.124	.4999
		.188=V or .250=B	.625 062								.125	.625	.234	.6249
		.188=V or .250=B	.750 075								.125	.75	.45	.7499
		.188=V or .250=B	.875 087								.125	.8750	.525	.8749
		.188=V or .250=B	1.00 100								.125	1	.6	.9999
		Working Length [L] Code		**062**	**075**	**087**	**100**	**112**	**125**	**137**				

Stock available

EXTENDED RANGE PUNCH

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4



*H = Head Diameter

OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS +.0005 - 0	Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES ±.0005	Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0	Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified	

ALTERATION OPTIONS

ABR	Blend radius other than .500" [Round only]
ABRD	Point length longer than standard lengths [Round only]
ABSH	Point length longer than standard lengths [Shape only]
AD	Reduce body diameter
AE	Ejector size — different than standard for punch
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
EBT	Extra back taper
MK	Multiple keys
PL	Precision Overall Length ±.001"
PT	Precision head thickness ±.0005"

For additional Alteration Options, see page 114.

ISP

IEP

No head draw on extended range.
No side hole on extended range.

ORDER

ROUND

STYLE SHANK POINT LENGTH 'B' 'P' DIM

ISP V 125 - 300 5 RD P=1.000 Optima

HEAD THICKNESS | OVERALL LENGTH | SHAPE | COATING

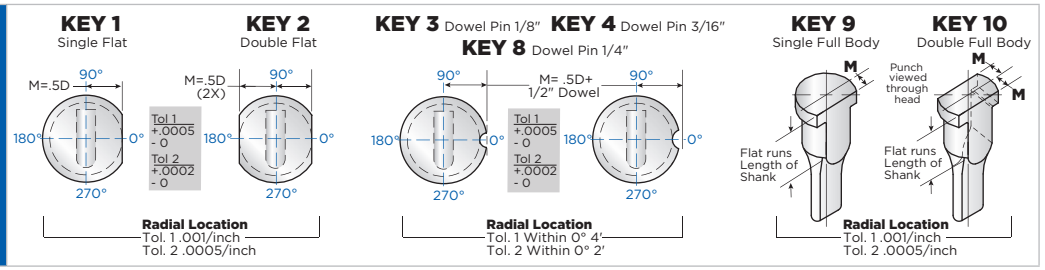
SHAPE

STYLE SHANK POINT LENGTH 'B' 'P' DIM CORNER RADIUS KEY ANGLE

IEP B 150 - 275 5 RT P=.900 W=.600 CR=.100 K2 Y0

HEAD THICKNESS | OVERALL LENGTH | SHAPE | 'W' DIM | KEY STYLE

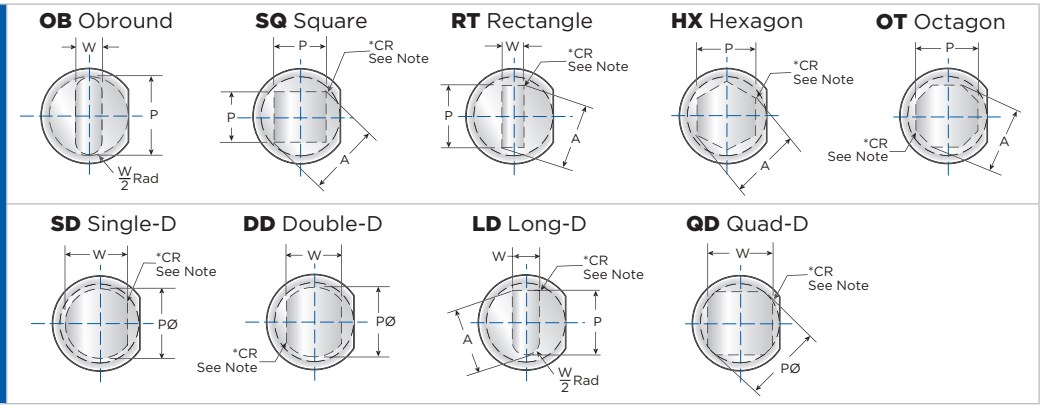
KEYS



NOTES

- **Key 1-4 & 8** included in all standard shapes price.
- Standard 'M' dim. for **Key 9 & 10** is .5D Dia. -.060.
- Alterations to keying, see page 118.
- Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES

Order Die View.

*.005 radius corners typical on shapes.

For special shapes see page 107.

EXTENDED RANGE PUNCH

	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 2.25	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	5.75	6.00	Point Length [B]	Absolute Min. P/W	Min. P	Min. W	Max. P/A
SOLID	ISP	.250=B or .188=V	1.25 125																	1.25=5	.282	.625	.282	1.25
																				1.50=6				
		.250=B or .188=V	1.50 150																	1.25=5	.3	.75	.3	1.5
																				1.50=6				
		.250=B or .188=V	1.75 175																	1.25=5	.35	1	.35	1.75
																				1.50=6				
		.250=B or .188=V	2.00 200																	1.25=5	.4	1.187	.4	2
																				1.50=6				
		.250=B or .188=V	2.25 225																	1.25=5	.45	1.375	.45	2.25
																				1.50=6				
		.250=B or .188=V	2.50 250																	1.25=5	.5	1.625	.5	2.5
																				1.50=6				
	Overall Length [L] Code			225	250	275	300	325	350	375	400	425	450	475	500	252	550	575	600					

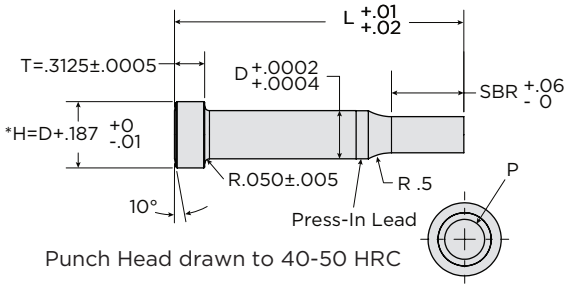
	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	Point Length [B]	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Ejector
EJECTOR	IEP	.250=B or .188=V	1.25 125																	1.25=5	.282	.625	.282	1.25	12 (.125)
																				1.50=6					
		.250=B or .188=V	1.50 150																	1.25=5	.3	.75	.3	1.5	12 (.125)
																				1.50=6					
		.250=B or .188=V	1.75 175																	1.25=5	.35	1	.35	1.75	12 (.125)
																				1.50=6					
		.250=B or .188=V	2.00 200																	1.25=5	.4	1.187	.4	2	12 (.125)
																				1.50=6					
		.250=B or .188=V	2.25 225																	1.25=5	.45	1.375	.45	2.25	12 (.125)
																				1.50=6					
		.250=B or .188=V	2.50 250																	1.25=5	.5	1.625	.5	2.5	12 (.125)
																				1.50=6					
	Overall Length [L] Code			225	250	275	300	325	350	375	400	425	450	475	500	252	550	575	600						

Stock available

HEADED

XTREME PUNCH

STANDARD MATERIAL ULTIMA® M4
ALTERNATE MATERIALS 10V AND 3V



*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES ±.0005 Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

ALTERATION OPTIONS

ABR	Blend radius other than .500" [Round only]
ABRD	Point length longer than standard lengths [Round only]
ABSH	Point length longer than standard lengths [Shape only]
AD	Reduce body diameter
AL	Overall length shorter [Shorten shank maintain point]
EBT	Extra back taper
MK	Multiple keys
PL	Precision Overall Length ±.001"

For additional Alteration Options, see page 114.

ORDER

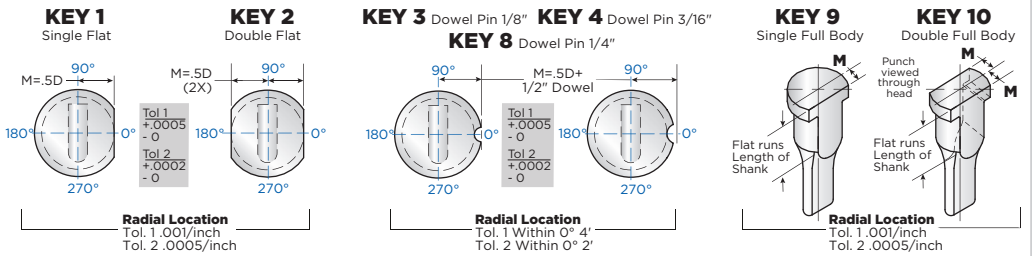
ROUND

STYLE **ISP** | HEAD THICKNESS **X** | SHANK **037** | OVERALL LENGTH **- 300** | SBR **3** | SHAPE **RD** | 'P' DIM **P=.250** | COATING **Optima**

SHAPE

STYLE **IEP** | HEAD THICKNESS **X** | SHANK **050** | OVERALL LENGTH **- 275** | SBR **4** | SHAPE **OB** | 'P' DIM **P=.400** | 'W' DIM **W=.200** | KEY STYLE **K1** | KEY ANGLE **Y90**

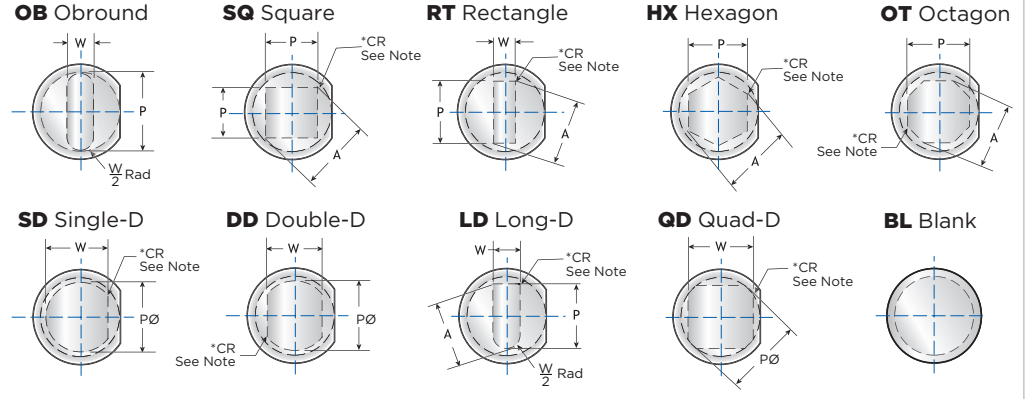
KEYS



NOTES

- **Key 1-4 & 8** included in all standard shapes price.
- Standard 'M' dim. for **Key 9 & 10** is .5D Dia. –.060.
- Alterations to keying, see page 118.
- Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES

Order Die View.

*.005 radius corners typical on shapes.

For special shapes see page 107.

SOLID

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L]																				SBR	Min. P/W	Max. P/A
			1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	475	5.00	5.25	5.50	5.75	6.00			
ISPX	.3125	.3125 031			4	4	4	4	4	4	4	4	4	4									.50=2	.090	.3125
						4	4	4	4	4	4	4	4	4									.75=3		
							4	4	4	4	4	4	4	4									1.00=4		
								4	4	4	4	4	4	4									1.25=5		
		.375 037			4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.090	.375
						4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3		
							4	4	4	4	4	4	4	4	4	4	4	4					1.00=4		
								4	4	4	4	4	4	4	4	4	4	4					1.25=5		
		.4375 043						4	4	4	4	4	4	4	4	4	4	4					.50=2	.130	.4375
								4	4	4	4	4	4	4	4	4	4	4					.75=3		
								4	4	4	4	4	4	4	4	4	4	4					1.00=4		
								4	4	4	4	4	4	4	4	4	4	4					1.25=5		
		.500 050			4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.130	.5
						4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3		
							4	4	4	4	4	4	4	4	4	4	4	4					1.00=4		
								4	4	4	4	4	4	4	4	4	4	4					1.25=5		
		.625 062			4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.200	.625
						4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3		
							4	4	4	4	4	4	4	4	4	4	4	4					1.00=4		
								4	4	4	4	4	4	4	4	4	4	4					1.25=5		
		.750 075			4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.200	.75
						4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3		
							4	4	4	4	4	4	4	4	4	4	4	4					1.00=4		
								4	4	4	4	4	4	4	4	4	4	4					1.25=5		
		.875 087			4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.200	.875
						4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3		
							4	4	4	4	4	4	4	4	4	4	4	4					1.00=4		
								4	4	4	4	4	4	4	4	4	4	4					1.25=5		
		1.00 100			4	4	4	4	4	4	4	4	4	4	4	4	4	4					.50=2	.250	1
						4	4	4	4	4	4	4	4	4	4	4	4	4					.75=3		
							4	4	4	4	4	4	4	4	4	4	4	4					1.00=4		
								4	4	4	4	4	4	4	4	4	4	4					1.25=5	.375	
Overall Length [L] Code			125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600			

EJECTOR

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L]																				SBR	Min. P/W	Max. P/A	Ejector
			2.00	2.25	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	5.75	6.00							
IEPX	.3125	.3125 031	4	4	4	4	4																.50=2	.120	.3125	4 (.046)
			4	4	4	4	4																.75=3			
			4	4	4	4	4																1.00=4			
		.375 037	4	4	4	4	4	4	4	4	4	4	4	4	4								.50=2	.165	.375	6 (.063)
			4	4	4	4	4	4	4	4	4	4	4	4	4								.75=3			
				4	4	4	4	4	4	4	4	4	4	4	4								1.00=4			
		.4375 043	4	4	4	4	4	4	4	4	4	4	4	4	4								.50=2	.165	.4375	6 (.063)
			4	4	4	4	4	4	4	4	4	4	4	4	4								.75=3			
			4	4	4	4	4	4	4	4	4	4	4	4	4								1.00=4			
		.500 050	4	4	4	4	4	4	4	4	4	4	4	4	4								.50=2	.165	.5	6 (.063)
			4	4	4	4	4	4	4	4	4	4	4	4	4								.75=3			
				4	4	4	4	4	4	4	4	4	4	4	4								1.00=4			
		.625 062	4	4	4	4	4	4	4	4	4	4	4										.50=2	.250	.625	9 (.094)
			4	4	4	4	4	4	4	4	4	4	4										.75=3			
				4	4	4	4	4	4	4	4	4	4										1.00=4			
		.750 075	4	4	4	4	4	4	4	4	4												.50=2	.250	.75	9 (.094)
			4	4	4	4	4	4	4	4	4												.75=3			
				4	4	4	4	4	4	4	4												1.00=4			
		.875 087	4	4	4	4	4	4	4	4	4												.50=2	.250	.875	9 (.094)
			4	4	4	4	4	4	4	4	4												.75=3			
				4	4	4	4	4	4	4	4												1.00=4			
		1.00 100	4	4	4	4	4	4	4	4	4	4	4										.50=2	.312	1	9 (.094)
			4	4	4	4	4	4	4	4	4	4	4										.75=3			
				4	4	4	4	4	4	4	4	4	4										1.00=4	.375		
Overall Length [L] Code			200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600							

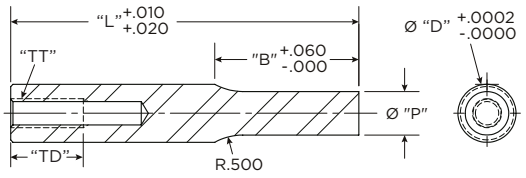
Stock available 4 Ultima® M4 steel available

HEADED

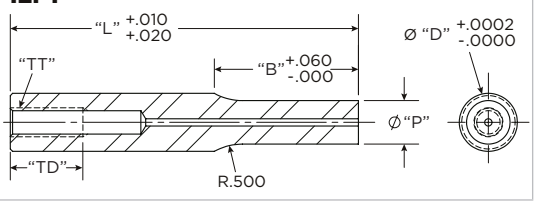
TAP BACK PUNCH

STANDARD MATERIAL M2 60-63 HRC — ALTERNATE MATERIALS 10V, M4, 3V, Ultima® M4

ISPT



IEPT



OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS
+.0005
- 0
Point to Shank Concentric within .0005 T.I.R.

#1 SHAPES
±.0005
Point to Shank Concentric within .001 T.I.R.

#2 ROUNDS & SHAPES
+.0002
- 0
Point to Shank Concentric within .0003 T.I.R.

ORDER

BLANK

STYLE SHANK SHAPE
ISPT 050 - 300 BL
OVERALL LENGTH

ROUND

STYLE SHANK POINT LENGTH 'B' 'P' DIM
IEPT 075 - 250 4 RD P=.687
OVERALL LENGTH SHAPE

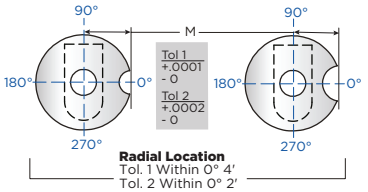
ALTERATION OPTIONS

ABR	Blend radius other than .500" [Round only]
ABRD	Point length longer than standard lengths [Round only]
ABSH	Point length longer than standard lengths [Shape only]
AD	Reduce body diameter
AL	Overall length shorter [Shorten shank maintain point]
EBT	Extra back taper
MK	Multiple keys
PL	Precision Overall Length ±.001"

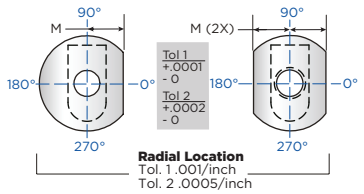
For additional Alteration Options, see page 114.

KEYS

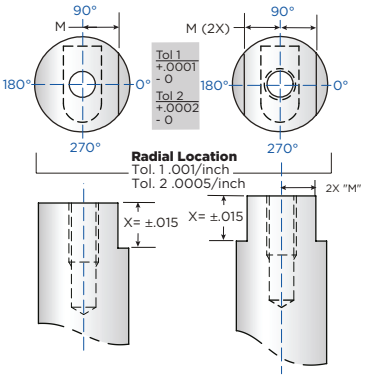
KEY 3 Dowel Pin 1/8" **KEY 4** Dowel Pin 3/16"
KEY 8 Dowel Pin 1/4"



KEY 9 Single Flat Full Body
KEY 10 Double Flat Full Body



KEY 11 Single Flat Non Working End
KEY 12 Double Flat Non Working End

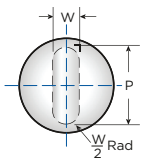


NOTES

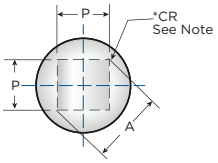
- **Key 3-4 & 8** included in all standard shapes price.
- Standard 'M' dim. for **Key 9 & 10** is .5D Dia.–.060.
- Standard 'M' dim. for **Key 11 & 12** is .5D Dia.–.060.
- Standard 'X' dim. for **Key 11 & 12** is .250.
- Alterations to keying, see page 118.
- Standard key angle at 0°.

SHAPES — DIE VIEW

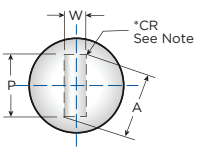
OB Obround



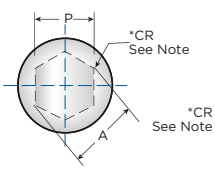
SQ Square



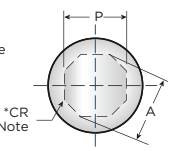
RT Rectangle



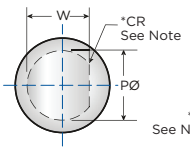
HX Hexagon



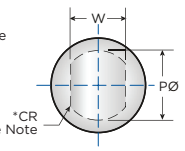
OT Octagon



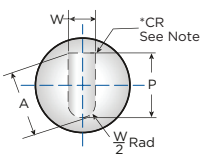
SD Single-D



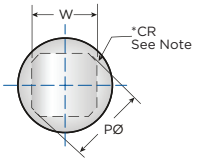
DD Double-D



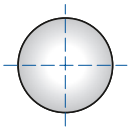
LD Long-D



QD Quad-D



BL Blank



NOTES

Order Die View.

*.005 radius corners typical on shapes.

For special shapes see page 107.

TAP BACK PUNCH

SOLID

Style Code	Shank Dia. [D]	Thread Type [TT]	Min Thread Depth [TD]	Overall Length [L]	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
ISPT	.250 025	8 - 32	.453	1.25 1.50 1.75 2.00 2.25 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 5.75 6.00	.50=2	.04	.06	.25
					.75=3			
					1.00=4			
					1.25=5	.06	.09	
					1.50=6	.09	.10	
	.3125 031	10 - 32	.500		.50=2	.06	.09	.3125
					.75=3			
					1.00=4			
					1.25=5	.09	.1	
					1.50=6			
	.375 037	10 - 32	.500		.50=2	.06	.09	.375
					.75=3			
					1.00=4			
					1.25=5	.09	.1	
					1.50=6			
	.4375 043	1/4 - 20	.625		.75=3	.09	.13	.4375
					1.00=4			
					1.25=5			
					1.50=6	.12	.13	
	.500 500	1/4 - 20	.625		.75=3	.09	.13	.5
					1.00=4			
					1.25=5			
					1.50=6	.12	.13	
	.625 062	5/16 - 18	.750		.75=3	.18	.2	.625
					1.00=4			
					1.25=5			
					1.50=6	.23	.25	
	.750 075	3/8 - 16	.875		.75=3	.18	.2	.75
					1.00=4			
					1.25=5			
					1.50=6	.23	.25	
Overall Length [L] Code				125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600				

EJECTOR

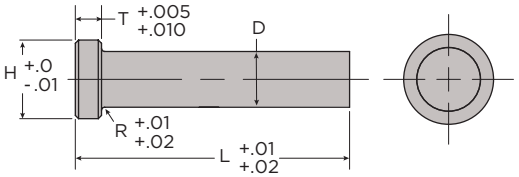
Style Code	Shank Dia. [D]	Thread Type [TT]	Min Thread Depth [TD]	Overall Length [L]	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A	Ejector
IEPT	.250 025	8 - 32	.453	1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00 4.25 4.50 4.75 5.00 5.25 5.50 5.75 6.00	.50=2	.08	.09	.25	2 (.020)
					.75=3				
					1.00=4				
					1.25=5				
	.3125 031	10 - 32	.500		.50=2	.115	.12	.3125	4 (.046)
					.75=3				
					1.00=4				
					1.25=5				
					1.50=6				
	.375 037	10 - 32	.500		.50=2	.158	.165	.375	4 (.046)
					.75=3				
					1.00=4				
					1.25=5				
					1.50=6				
	.4375 043	1/4 - 20	.625		.75=3	.158	.165	.4375	6 (.063)
					1.00=4				
					1.25=5				
					1.50=6				
	.500 500	1/4 - 20	.625		.75=3	.158	.165	.5	6 (.063)
					1.00=4				
					1.25=5				
					1.50=6				
	.625 062	5/16 - 18	.750		.75=3	.235	.25	.625	9 (.094)
					1.00=4				
					1.25=5				
					1.50=6				
	.750 075	3/8 - 16	.875		.75=3	.235	.25	.75	9 (.094)
					1.00=4				
					1.25=5				
					1.50=6				
Overall Length [L] Code				125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600					

Stock available

HEADED

STRAIGHT PUNCH

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4



Punch Head drawn to 40-50 HRC

OPTIONAL TOLERANCE [D]
TOLERANCE #1 +.0005 - 0 Concentric within .0005 T.I.R.
TOLERANCE #2 +.0002 - 0 Concentric within .0003 T.I.R.
Foretaper only, head end large .0001 total
Tolerance #1 unless specified

ALTERATION OPTIONS	
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
PL	Precision Overall Length ±.001"
PT	Precision head thickness ±.0005"

For additional Alteration Options, see page 114.

ORDER

STYLE | SHANK | 'D' DIM | COATING

ISS V 037 - 250 D= .350 TOL2 Optima

HEAD THICKNESS | OVERALL LENGTH | TOLERANCE

SOLID

Style Code	Head THK [T]	Shank Dia. [D]	Shank Code	Overall Length [L] 1.25	1.50	1.75	2.00	2.25	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	5.75	6.00	Min. D	Max. D	Head Dia. [H]
ISS	.125=B or .188=V	.125	012																					.062	.125	.25
		.1875	018																					.1251	.1875	.312
		.25	025																					.1876	.25	.375
		.3125	031																					.2501	.3125	.438
	.188=V	.375	037																					.3126	.375	.5
		.4375	043																					.3751	.4375	.562
	.250=B or .188=V	.5	050																					.4376	.5	.625
		.625	062																					.5001	.625	.75
Overall Length [L] Code				125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600			

For nominal size punches, see page 10 for available blanks.

ORDER

STYLE | SHANK | SIDE HOLE LOCATION

IES B 062 - 300 4 D= .526

HEAD THICKNESS | OVERALL LENGTH | 'D' DIM

EJECTOR

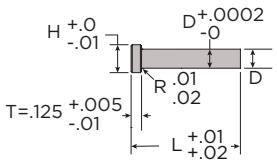
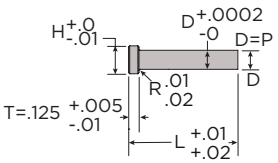
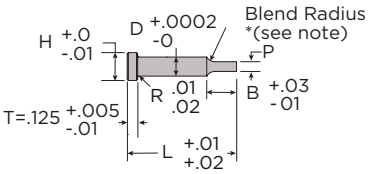
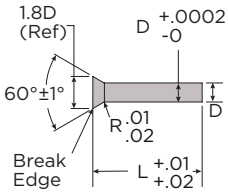
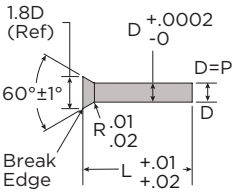
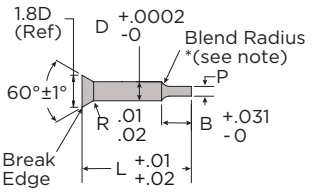
Style Code	Head THK [T]	Shank Dia. [D]	Shank Code	Overall Length [L] 1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	Side Hole Location [B]	Min. D	Max. D	Head Dia. [H]	Ejector
IES	.125=B or .188=V	.25	025																					.50=2	.187	.25	.375	3 (.032)
		.3125	031																					.50=2	.2501	.3125	.438	4 (.046)
																								.75=3				
	.188=V	.375	037																					.50=2	.3126	.375	.5	6 (.063)
																								.75=3				
		.4375	043																					.75=3	.3751	.4375	.562	6 (.063)
																								1.00=4				
		.5	050																					.75=3	.4376	.5	.625	6 (.063)
																								1.00=4				
	.250=B or .188=V	.625	062																					.75=3	.5001	.625	.75	9 (.094)
																								1.00=4				
Overall Length [L] Code				125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600					

For nominal size punches, see page 11 for available blanks.

Stock available

CLOSE SPACE PUNCH

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4

BLANK [BL]	STRAIGHT PUNCH	PUNCH
		
		

OPTIONAL TIP TOLERANCE [P]

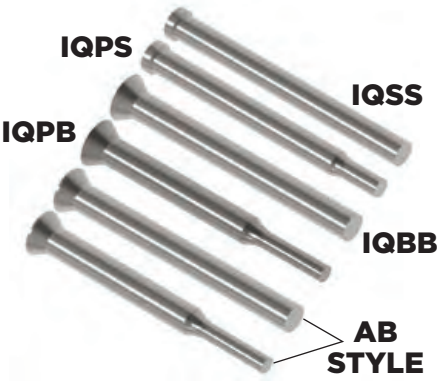
TOLERANCE #1
+.0005
- 0
Point to Shank Concentric within .0005 T.I.R.

TOLERANCE #2
+.0002
- 0
Point to Shank Concentric within .0003 T.I.R.

Tolerance #1 unless specified.
*Blend Radius = .250 if not specified.

'AB' STYLE HEAD
60°

Available upon request



ROUND & BLANK

Style Code 60° HEAD	Style Code STD HEAD	Shank Dia. [D]	Overall Length (L) 1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	Head Dia. 60° (H)	Head Dia. STD (H)	Point Length [B]
IQBB Blank IQPB Round	IQBS Blank IQPS Round	.0625 006												1.8D	.125	.187
		.0938 009												1.8D	.156	.25
		.125 012												1.8D	.188	.312
		.1562 015												1.8D	.218	.312
		.1875 018												1.8D	.25	.312
		.2188 021												1.8D	.281	.312
		.250 025												1.8D	.312	.312
Overall Length [L] Code			150	175	200	225	250	275	300	325	350	375	400			

ORDER BLANK
STYLE IQBB | SHANK 015 | - 250 OVERALL LENGTH | SHAPE BL

ORDER ROUND
STYLE IQPS | SHANK 021 | - 225 OVERALL LENGTH | 'P' DIM P=.189

STRAIGHT

Style Code 60° HEAD	Style Code STD HEAD	Shank Dia. [D]	Overall Length (L) 1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	Min. D	Max. D	Head Dia. 60° (H)	Head Dia. STD (H)
IQSB	IQSS	.0625 006												.03	.063	1.8D	.125
		.0938 009												.0631	.094	1.8D	.156
		.125 012												.0941	.125	1.8D	.188
		.1562 015												.1251	.157	1.8D	.218
		.1875 018												.1571	.188	1.8D	.25
		.2188 021												.1881	.219	1.8D	.281
		.250 025												.2191	.25	1.8D	.312
Overall Length [L] Code			150	175	200	225	250	275	300	325	350	375	400				

ORDER STRAIGHT
STYLE IQSS | SHANK 012 | - 225 OVERALL LENGTH | 'D' DIM D=.100

ALTERATION OPTIONS

AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
PL	Precision Overall Length ±.001"
PT	Precision head thickness ±.0005"

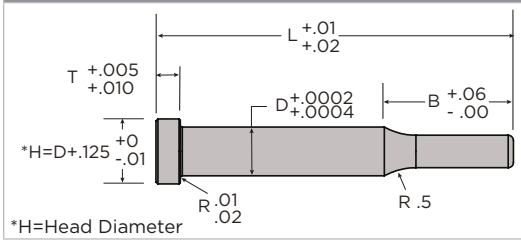
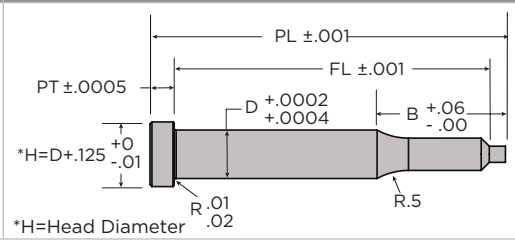
For additional Alteration Options, see page 114.

Stock available

- 60° Head available larger than .2500 body diameter
- If "D" is greater than .2500, T=.156

ROUND FORM PUNCH

STANDARD MATERIAL M2 — ALTERNATE MATERIALS M4, 10V, 3V ULTIMA® M4

ROUND FORM WITHOUT 'FL' (FORM LENGTH)	ROUND FORM WITH 'FL' (FORM LENGTH) ALL ROUND FORM WITH 'FL' ARE PT AND PL
 *H=Head Diameter	 *H=Head Diameter

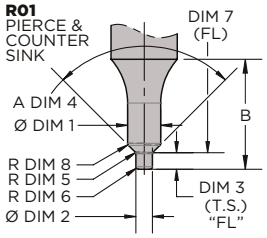
OPTIONAL TIP TOLERANCE [P]

TOLERANCE #1
+.0005
- 0
Point to Shank Concentric within .0005 T.I.R.

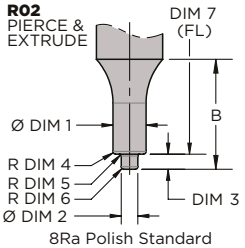
TOLERANCE #2
+.0002
- 0
Concentric within .0003 T.I.R.

OPTIONAL LENGTH & HEAD THICKNESS TOLERANCE
PL ±.001
PT ±.0005

R01 PIERCE & COUNTER SINK

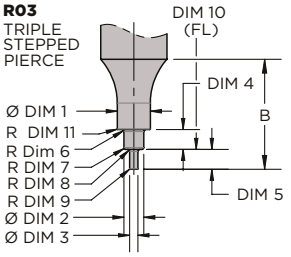


R02 PIERCE & EXTRUDE

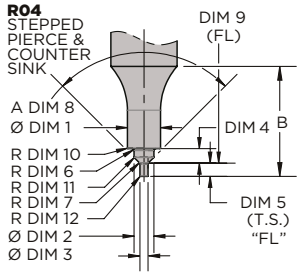


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

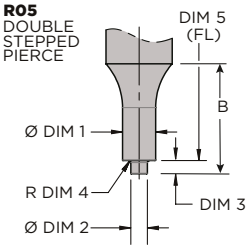
R03 TRIPLE STEPPED PIERCE



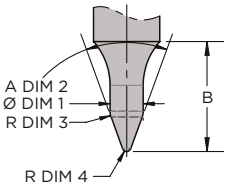
R04 STEPPED PIERCE & COUNTER SINK



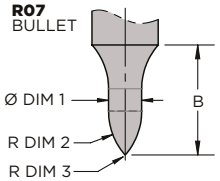
R05 DOUBLE STEPPED PIERCE



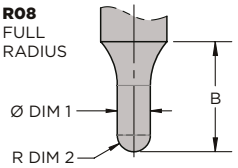
R06 CONE



R07 BULLET

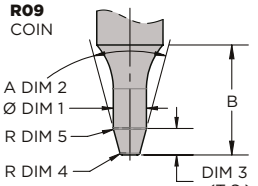


R08 FULL RADIUS

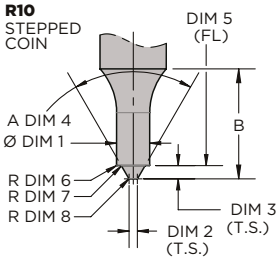


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

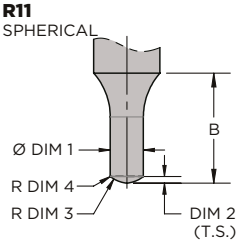
R09 COIN



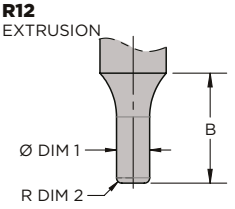
R10 STEPPED COIN



R11 SPHERICAL

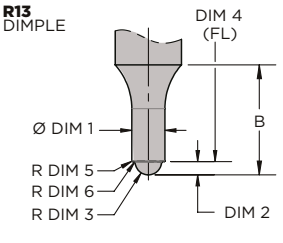


R12 EXTRUSION

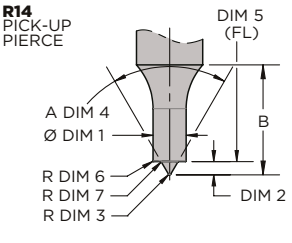


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

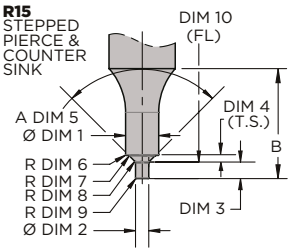
R13 DIMPLE



R14 PICK-UP PIERCE



R15 STEPPED PIERCE & COUNTER SINK



ORDER

Take standard catalog part number + round form part number.

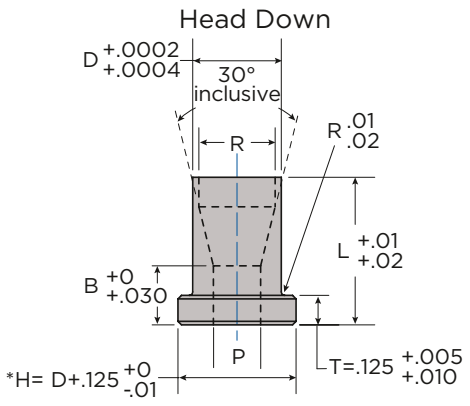
EXAMPLE:
ISPV050-3004-RO5
DIM. 1
DIM. 2
DIM. 3
DIM. 4
DIM. 5

All internal corners will have an internal radius of .010 minimum.

HEADED

CLOSE SPACE GUIDE

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS M4, 10V, 3V, ULTIMA® M4



*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES +.001 - 0 Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

ORDER

STYLE ICSG | SHANK 037 | OVERALL LENGTH 062 | 'P' DIM P=.125

ICSG 037 - 062 P=.125

CLOSE SPACE GUIDES

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length (L) .500	.625	.750	1.00	Min [P]	Max. [P]	Head Dia [H]	Relief [R]
ICSG	.125	.1875 018					.032	.0625	.312	.141
		.250 025					.032	.0938	.375	.201
		.3125 031					.032	.125	.437	.261
		.375 037					.032	.1562	.5	.323
		.4375 043					.062	.1875	.562	.386
		.500 050					.062	.2188	.625	.448
		.625 062					.062	.25	.75	.515
	Overall Length [L] Code		050	062	075	100				

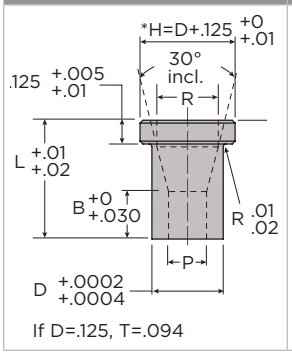
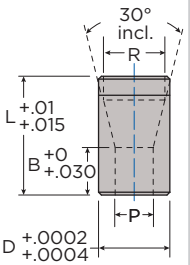
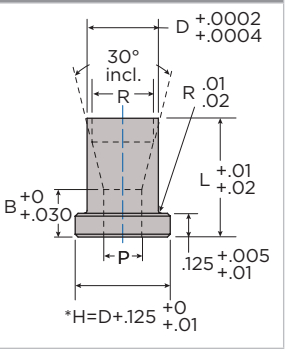
Stock available

DIE LAND EXAMPLE
(P = .200) **.82 X .200 + .082 = .246**

Land Length [L]	
P	B
≤.065	2P
.0651 – .0950	P + .065
≥.0951	.82P + .082

HEADED

GUIDE BUSHINGS

STANDARD MATERIAL M2 60-63 HRC ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4		
HEAD UP	HEADLESS	HEAD DOWN
		
If D=.125, T=.094		

*H=Head Diameter

OPTIONAL HOLE TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Hole to Body Concentric within .0005 T.I.R.
#1 SHAPES +.001 - 0 Hole to Body Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Hole to Body Concentric within .0003 T.I.R.
Tolerance #1 unless specified

ALTERATION OPTIONS	
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
ART	Relief taper other than standard
AT	Altered head thickness
PL	Precision Overall Length ±.001"
PT	Precision head thickness ±.0005"

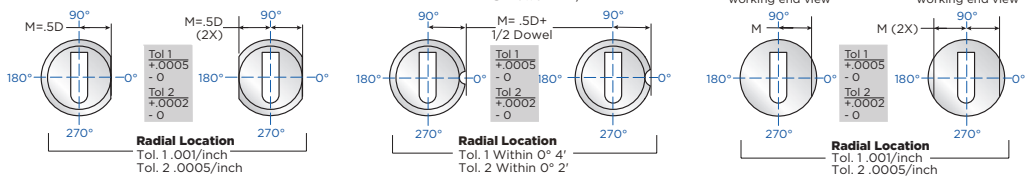
For additional Alteration Options, see page 114.

ORDER SHAPE

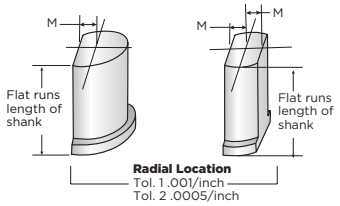
STYLE	SHANK		SHAPE		'W' DIM	KEY ANGLE
IHDG	025	- 050	OB	P=.100	W=.087	K1 Y=0
		OVERALL LENGTH		'P' DIM		KEY TYPE

KEYS

KEY 1 (Single Flat)
KEY 2 (Double Flat)
KEY 3 Dowel Pin 1/8" **KEY 4** Dowel Pin 3/16"
KEY 8 Dowel Pin 1/4"
KEY 5 (Single Flat) working end view
KEY 6 (Double Flat) working end view

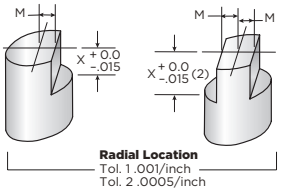


KEY 9 (Single Full Body)
KEY 10 (Double Full Body)



OR

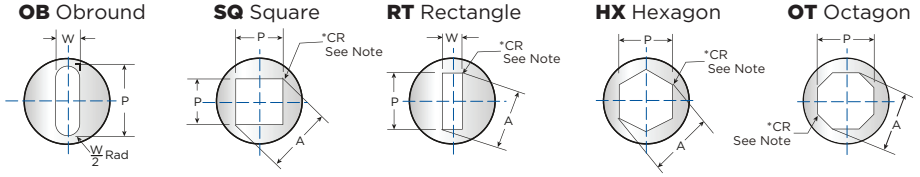
KEY 5 working end view
KEY 6 working end view



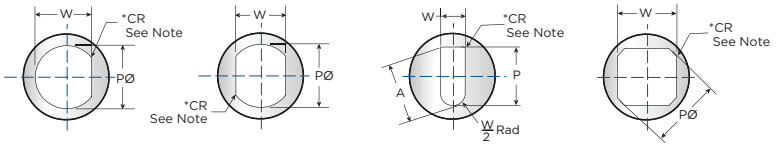
NOTES
• **Key 1-4 & 8** included in all standard shapes price. • Standard 'M' dim. for **Key 5, 6, 9 & 10**, see page 118. • Standard 'M' and alterations to keying, see page 118. • Standard key angle at 0°.

SHAPES — DIE VIEW

OB Obround
SQ Square
RT Rectangle
HX Hexagon
OT Octagon



SD Single-D
DD Double-D
LD Long-D
QD Quad-D



NOTES
Order Die View. *.007 radius corners typical on shapes. For special shapes see page 107.

GUIDE BUSHINGS

HEAD UP

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length (L) .250	.3125	.375	.500	.625	.750	1.00	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Relief Dia. [R]
IHUG	.125	.125 012								.03	.031	.031	.062	.076
		.1875 018								.05	.062	.05	.13	.141
		.250 025								.05	.062	.05	.17	.201
		.3125 031								.05	.093	.05	.212	.261
		.375 037								.05	.125	.05	.255	.323
		.4375 043								.075	.187	.075	.297	.386
		.500 050								.075	.212	.075	.344	.448
		.625 062								.075	.293	.075	.425	.515
	Overall Length [L] Code		025	031	037	050	062	075	100					

HEADLESS

Style Code	Shank Dia. [D]	Overall Length (L) .250	.3125	.375	.500	.625	.750	1.00	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Relief Dia. [R]
IHLG	.125 012								.03	.031	.031	.062	.076
	.1875 018								.05	.062	.05	.13	.141
	.250 025								.05	.062	.05	.17	.201
	.3125 031								.05	.093	.05	.212	.261
	.375 037								.05	.125	.05	.255	.323
	.4375 043								.075	.187	.075	.297	.386
	.500 050								.075	.212	.075	.344	.448
	.625 062								.075	.293	.075	.425	.515
Overall Length [L] Code		025	031	037	050	062	075	100					

HEAD DOWN

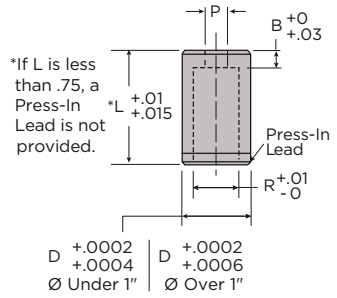
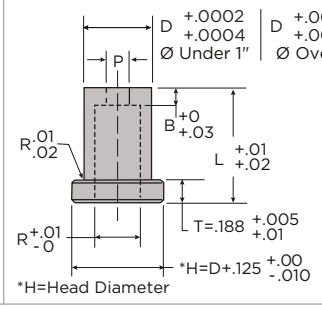
Style Code	Head THK [T]	Shank Dia. [D]	Overall Length (L) .250	.3125	.375	.500	.625	.750	1.00	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Relief Dia. [R]
IHDG	.125	.125 012								.03	.031	.031	.062	.076
		.1875 018								.05	.062	.05	.13	.141
		.250 025								.05	.062	.05	.17	.201
		.3125 031								.05	.093	.05	.212	.261
		.375 037								.05	.125	.05	.255	.323
		.4375 043								.075	.187	.075	.297	.386
		.500 050								.075	.212	.075	.344	.448
		.625 062								.075	.293	.075	.425	.515
	Overall Length [L] Code		025	031	037	050	062	075	100					

DIE LAND EXAMPLE
(P = .200) **.82 X .200 + .082 = .246**

Land Length [L]	
P	B
≤.065	2P
.0651 – .0950	P + .065
≥.0951	.82P + .082

Stock available

COUNTERBORE RELIEF DIE

STANDARD MATERIAL M2 60-63 HRC ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4	
HEADLESS	**HEADED**
	
BLANKS: Available with start hole. Start hole concentric to body within .005" and contains a counterbore.	

OPTIONAL HOLE TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Hole to Body — Concentric within .0005 T.I.R.
#1 SHAPES +.001 -0 Hole to Body — Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Hole to Body — Concentric within .0003 T.I.R.
Tolerance #1 unless specified

ALTERATION OPTIONS	
AD	Reduce body diameter
ADL	Altered die diameter
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
ARD	Relief diameter larger than standard size
AT	Altered head thickness
PL	Precision Overall Length ±.001"
PT	Precision head thickness ±.0005"
SH2	Slug Hugger®2
SH4L	Slug Hugger®4L

For additional Alteration Options, see page 114.

ORDER ROUND

STYLE | SHANK | SHAPE | 'P' DIM | SLUG HUGGER | TOTAL CLEARANCE

IDDC 075 - 100 RD P=.400 SH2 CLR= .010

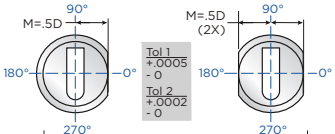
OVERALL LENGTH

MAT=Mild Steel MT= .125

MATERIAL TYPE | MATERIAL THICKNESS

KEYS

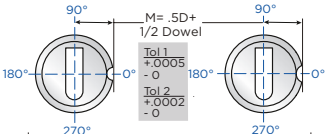
KEY 1 (Single Flat)



KEY 2 (Double Flat)

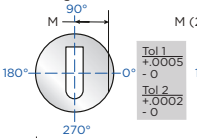
Radial Location
Tol. 1 .001/inch
Tol. 2 .0005/inch

KEY 3 Dowel Pin 1/8" **KEY 4** Dowel Pin 3/16"
KEY 8 Dowel Pin 1/4"

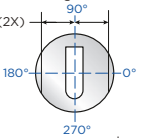


Radial Location
Tol. 1 Within 0° 4'
Tol. 2 Within 0° 2'

KEY 5 (Single Flat) working end view

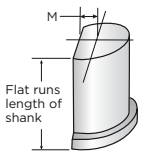


KEY 6 (Double Flat) working end view

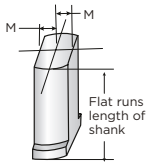


Radial Location
Tol. 1 .001/inch
Tol. 2 .0005/inch

KEY 9 (Single Full Body)



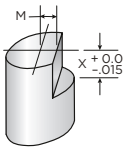
KEY 10 (Double Full Body)



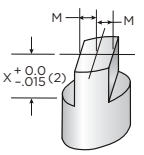
Radial Location
Tol. 1 .001/inch
Tol. 2 .0005/inch

OR

KEY 5 working end view



KEY 6 working end view



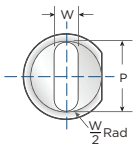
Radial Location
Tol. 1 .001/inch
Tol. 2 .0005/inch

NOTES

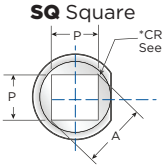
- **Key 1-4 & 8** included in all standard shapes price.
- Standard 'M' dimension for **Key 5, 6, 9 & 10**, see page 118.
- Standard 'M' and alterations to keying, see page 118.
- Standard key angle at 0°.

SHAPES — DIE VIEW

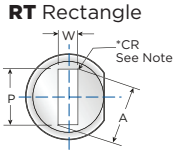
OB Obround



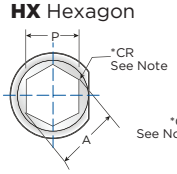
SQ Square



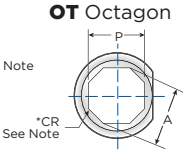
RT Rectangle



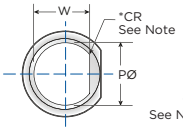
HX Hexagon



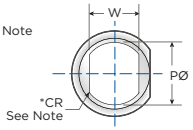
OT Octagon



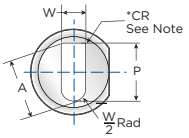
SD Single-D



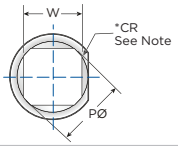
DD Double-D



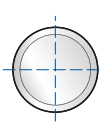
LD Long-D



QD Quad-D



BL Blank



NOTES

Order Die View.

*.007 radius corners typical on shapes.

For special shapes see page 107.

COUNTERBORE RELIEF DIE

HEADLESS

Style Code	Shank Dia. [D]	Overall Length (L) .750	.875	.9375	1.00	1.125	1.25	1.375	1.50	1.75	2.00	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Relief Dia. [R]	Die Land [B]
IDDC	.250 025											.032	.048	.048	.095	.125	.156
													.096		.125	.156	
	.3125 031											.032	.048	.048	.161	.191	.187
	.375 037											.032	.048	.048	.095	.125	.156
													.096		.125	.156	
													.126	.048	.195	.228	.187
	.4375 043											.032	.048	.048	.251	.281	.187
	.500 050											.032	.062	.062	.195	.228	.187
													.196		.285	.312	
	.625 062											.032	.093	.093	.285	.312	.187
													.286		.345	.375	
	.750 075											.032	.118	.118	.345	.375	.187
													.346		.435	.468	.25
	.875 087											.032	.125	.125	.435	.468	.25
													.436		.545	.578	
	1.00 100											.032	.156	.156	.545	.578	.25
													.546		.655	.687	
	1.25 125											.032	.187	.187	.655	.687	.25
													.656		.78	.812	.312
	1.50 150											.032	.25	.25	.78	.812	.312
													.781		.905	.937	
													.906		1.035	1.062	
	1.75 175											.032	.25	.25	1.4	1.43	.312
	2.00 200											.032	.875	.25	1.6	1.63	.34
	2.25 225											.032	1	.312	1.8	1.83	.34
	2.50 250											.032	1.125	.375	2	2.03	.34
	2.75 275											.032	1.25	.437	2.2	2.23	.34
Overall Length [L] Code		075	087	093	100	112	125	137	150	175	200						

HEADED

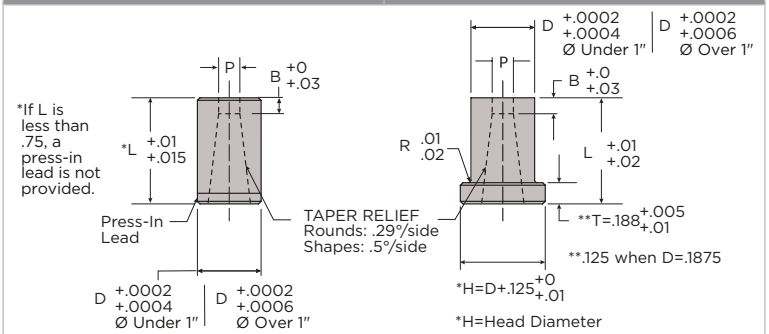
Style Code	Head THK [T]	Shank Dia. [D]	Overall Length (L) .750	.875	.9375	1.00	1.125	1.25	1.375	1.50	1.75	2.00	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Relief Dia. [R]	Die Land [B]
IHDC	.1875	.250 025											.032	.048	.048	.095	.125	.156
														.096		.125	.156	
		.3125 031											.032	.048	.048	.161	.191	.187
		.375 037											.032	.048	.048	.095	.125	.156
														.096		.125	.156	
														.126		.195	.228	.187
		.4375 043											.032	.048	.048	.251	.281	.187
		.500 050											.032	.062	.062	.195	.228	.187
														.196		.285	.312	
		.625 062											.032	.093	.093	.285	.312	.187
														.286		.345	.375	
		.750 075											.032	.118	.118	.345	.375	.187
														.346		.435	.468	.25
		.875 087											.032	.125	.125	.435	.468	.25
														.436		.545	.578	
		1.00 100											.032	.156	.156	.545	.578	.25
														.546		.655	.687	
		1.25 125											.032	.187	.187	.655	.687	.25
														.656		.78	.812	.312
		1.50 150											.032	.25	.25	.78	.812	.312
														.781		.905	.937	
														.906		1.035	1.062	
Overall Length [L] Code			075	087	093	100	112	125	137	150	175	200						

Stock available

HEADED

TAPER RELIEF DIE

STANDARD MATERIAL M2 60-63 HRC ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4	
HEADLESS	HEADED



BLANKS: Available with start hole or no start hole. Start hole concentric to body within .005". **Standard Die Land (B) = .125"**. Optional Die Land available.

OPTIONAL HOLE TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Hole to Body — Concentric within .0005 T.I.R.
#1 SHAPES +.001 -0 Hole to Body — Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Hole to Body — Concentric within .0003 T.I.R.
Tolerance #1 unless specified

ORDER ROUND

STYLE SHANK SHAPE 'P' DIM

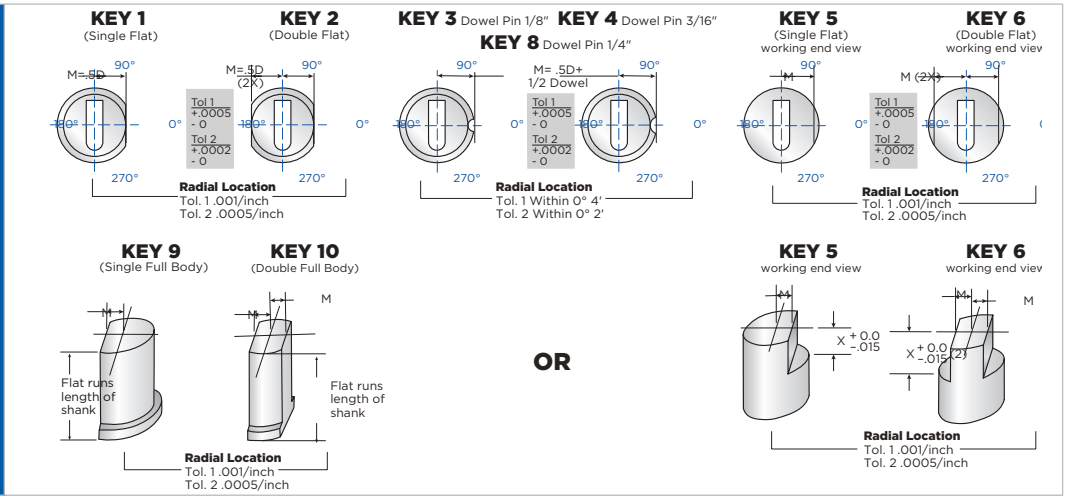
IHDT 125 - 150 RD P=.800

OVERALL LENGTH

ALTERATION OPTIONS	
AD	Reduce body diameter
ADL	Altered head diameter
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
ART	Relief taper other than standard
AT	Altered head thickness
PL	Precision Overall Length ±.001"
PT	Precision head thickness ±.0005"
SH2	Slug Hugger® 2
SH4L	Slug Hugger® 4L

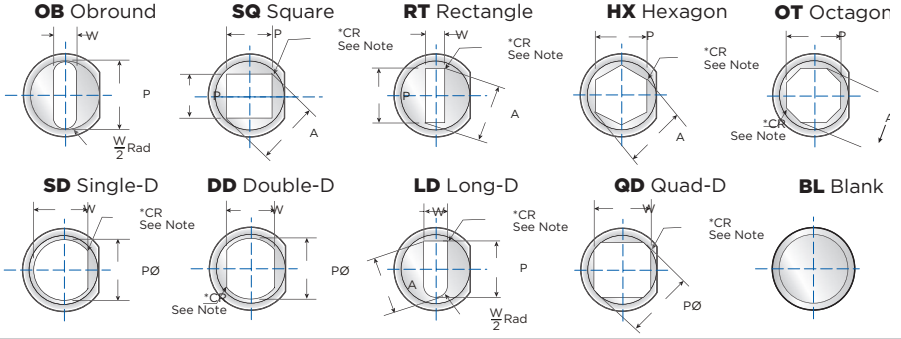
For additional Alteration Options, see page 114.

KEYS



NOTES
• **Key 1-4 & 8** included in all standard shapes price. • Standard 'M' dimension for **Key 5, 6, 9 & 10** see page 118. • Standard M and alterations to keying, see page 118. • Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES
Order Die View. *.007 radius corners typical on shapes. For special shapes see page 107.

TAPER RELIEF DIE

HEADLESS

Style Code	Shank Dia. [D]	Overall Length (L) .500	.625	.750	.875	1.00	1.125	1.25	1.375	1.50	1.75	2.00	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Die Land [B]
IDDT	.1875 018												.032	.038	.05	.13	.125
	.250 025												.032	.05	.05	.17	.125
	.3125 031												.032	.062	.05	.212	.125
	.375 037												.032	.075	.05	.255	.125
	.4375 043												.032	.13	.075	.297	.125
	.500 050												.032	.15	.075	.344	.125
	.625 062												.032	.188	.075	.425	.125
	.750 075												.032	.225	.075	.51	.125
	.875 087												.032	.3	.075	.595	.125
	1.00 100												.032	.4	.075	.68	.125
	1.25 125												.032	.5	.075	.85	.125
	1.50 150												.032	.6	.075	1.05	.125
	1.75 175												.032	.75	.13	1.4	.125
	2.00 200												.032	.875	.13	1.6	.125
	2.25 225												.032	1	.13	1.8	.125
	2.50 250												.032	1.125	.13	2	.125
	2.75 275												.032	1.25	.13	2.2	.125
Overall Length [L] Code		050	062	075	087	100	112	125	137	150	175	200					

HEADED

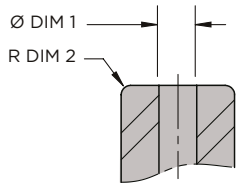
Style Code	Head THK [T]	Shank Dia. [D]	Overall Length (L) .500	.625	.750	.875	1.00	1.125	1.25	1.375	1.50	1.75	2.00	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Die Land [B]
IHDT	.125	.1875 018												.032	.038	.05	.13	.125
	.1875	.250 025												.032	.05	.05	.17	.125
		.3125 031												.032	.062	.05	.212	.125
		.375 037												.032	.075	.05	.255	.125
		.4375 043												.032	.13	.075	.297	.125
		.500 050												.032	.15	.075	.344	.125
		.625 062												.032	.188	.075	.425	.125
		.750 075												.032	.225	.075	.51	.125
		.875 087												.032	.3	.075	.595	.125
		1.00 100												.032	.4	.075	.68	.125
		1.25 125												.032	.5	.075	.85	.125
		1.50 150												.032	.6	.075	1.05	.125
		1.75 175												.032	.75	.13	1.4	.125
		2.00 200												.032	.875	.13	1.6	.125
		2.25 225												.032	1	.13	1.8	.125
		2.50 250												.032	1.125	.13	2	.125
		2.75 275												.032	1.25	.13	2.2	.125
Overall Length [L] Code			050	062	075	087	100	112	125	137	150	175	200					

Stock available

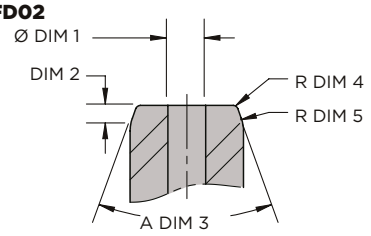
ROUND FORM DIE

STANDARD MATERIAL M2 60-63 HRC — ALTERNATE MATERIALS M4, 10V, 3V, ULTIMA® M4

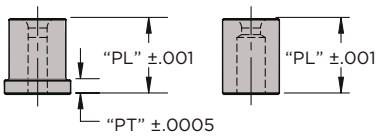
FD01



FD02

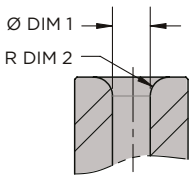


ALSO AVAILABLE WITH TAPER OR COUNTERBORE RELIEF



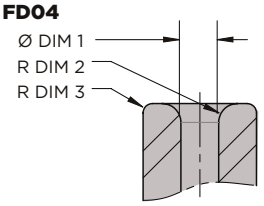
Offer 8Ra, 6Ra & 4Ra Polish

FD03



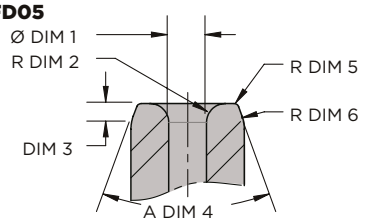
"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD04



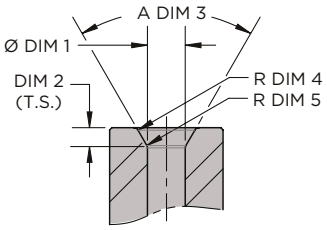
"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD05

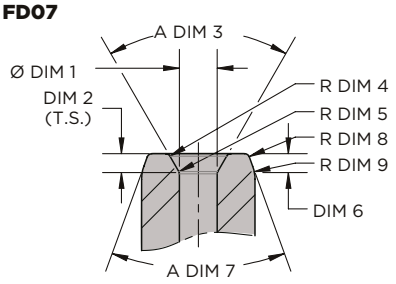


"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

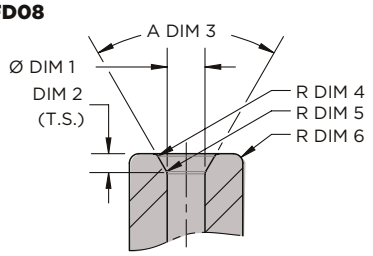
FD06



FD07



FD08



ORDER

Take standard catalog part number plus round tip part number.

EXAMPLE:

IHDT100-150 FD03

DIM. 1

DIM. 2

OPTIONAL HOLE TOLERANCE [P]
TOLERANCE #1 +.0005 - 0 Hole to Body Concentric within .0005 T.I.R.
TOLERANCE #2 +.0002 - 0 Hole to Body Concentric within .0003 T.I.R.

HEADED

ELIMINATE COSTLY SLUG PULLING

Slug pulling can cause expensive press downtime. At the Impax Tooling Solutions® division of Wilson Tool International, our desire to provide innovative tooling solutions for our customers has lead us to develop the Slug Hugger® die design which helps eliminate the very costly problem of slug pulling.

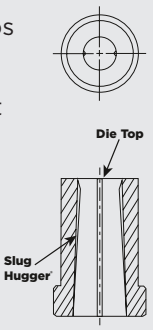
The Slug Pulling Solution

Slug Hugger dies help eliminate scrapped parts, costly downtime, and possible press and tooling damage due to slug pulling.

This unique design helps eliminate unnecessary back-pressure on small punch tips by preventing packed slugs. The Slug Hugger 2 design works on most material types and thicknesses including aluminum and stainless steel while Slug Hugger 4L is specifically designed for thinner materials. They are an available option on all die configurations: taper relief, counterbore relief, headed or headless.

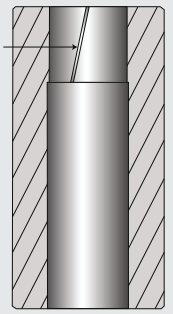
SLUG HUGGER® 2

The Slug Hugger 2 design grabs the slug just below the cutting surface of the die and retains it during the stripping process. Precision "nips" hold slugs in the die and when capacity is reached, one slug per hit is released through the relief.



SLUG HUGGER® 4L

The Slug Hugger 4L retains slugs with the assistance of cavities on the inside of the die. These cavities hold the slug in place after the hit occurs. While the 4L can be used with any material thickness, it is ideal for stamping thinner materials and |is recommended for clearances of less than .004".



Ordering Slug Hugger Dies

- Use the clearance you want and the die type you like.
- The minimum P/W dimension for the Slug Hugger 4L is 0.050" [1.27mm].
- The minimum total clearance for Slug Hugger 4L shape is 0.001" [.026mm], a round is 0.0005" [.013mm]
- The minimum total P/W dimension for the Slug Hugger 2 is 0.035" [.89mm].
- Minimum clearance for a Slug Hugger 2 shape or round is 0.004" [.10mm] total.

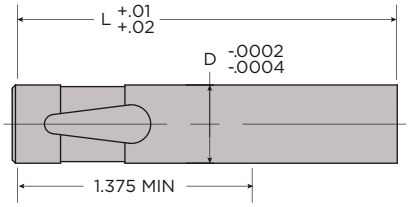
Simply specify that you'd like Slug Hugger 2 or 4L when you place your tooling order. Indicate the type and thickness of material you are stamping as well as your desired clearance. See the example below:

	Quantity	Catalog Number	Shape	P	W	Tolerance	Type	Material Type	Material Thickness	Die Clearance Specify Per Side or Total
INCH	2	**IDDT100-125** Headless Taper Relief Die Round	RD	.5000"	—	1	Slug Hugger® 2	Cold Rolled	.060"	.010" Per Side
INCH	1	**IHDT100-125** Headed Taper Relief Die Shape	OB	.6500"	.4000"	1	Slug Hugger® 4L	Cold Rolled	.020"	.002" Per Side
METRIC	1	**MHDT16-25** Metric Headed Tape Relief Die Shape	SQ	6.5mm	—	1	Slug Hugger® 2	Alum	1.5mm	.105mm Per Side

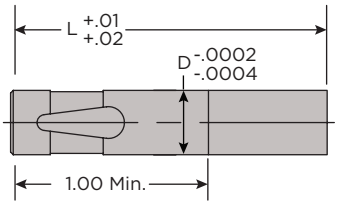
HEAVY & LIGHT DUTY SOLID BLANKS

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4

HEAVY DUTY



LIGHT DUTY



ORDER HEAVY DUTY

STYLE — OVERALL LENGTH

IHSP 037 - 300 BL

SHANK — SHAPE

ORDER LIGHT DUTY

STYLE — OVERALL LENGTH

ILSP 037 - 300 BL

SHANK — SHAPE

HEAVY DUTY SOLID

Style Code	Shank Dia. [D]	Overall Length [L] 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	5.75	6.00
IHSP	.375 037	4	4	4	4	4	4	4								
	.500 050	4	4	4	4	4	4	4								
	.625 062	4	4	4	4	4	4	4								
	.750 075	4	4	4	4	4	4	4								
	.875 087		4	4	4	4	4	4								
	1.00 100			4	4	4	4	4								
	1.25 125			4	4	4	4	4								
Overall Length [L] Code		**250**	**275**	**300**	**325**	**350**	**375**	**400**	**425**	**450**	**475**	**500**	**525**	**550**	**575**	**600**

LIGHT DUTY SOLID

Style Code	Shank Dia. [D]	2.00	2.25	Overall Length [L] 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	5.75	6.00
ILSP	.250 025	4	4	4	4	4												
	.375 037	4	4	4	4	4												
	.500 050	4	4	4	4	4												
	.625 062		4	4	4	4												
	.750 075		4	4	4	4												
	.875 087			4	4	4												
	1.00 100			4	4	4												
Overall Length [L] Code		**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**	**425**	**450**	**475**	**500**	**525**	**550**	**575**	**600**

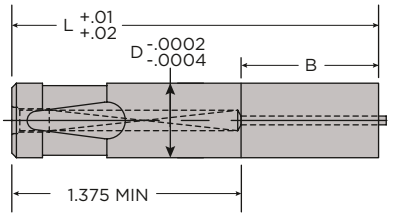
Stock available 4 Ultima® M4 steel available

BALL LOCK

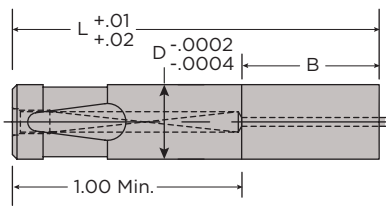
HEAVY & LIGHT DUTY EJECTOR BLANKS

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, Ultima® M4

HEAVY DUTY



LIGHT DUTY



ORDER

HEAVY DUTY

STYLE — OVERALL LENGTH — SHAPE

IHEP 037 - 300 6 BL

SHANK — SIDE HOLE LOCATION

LIGHT DUTY

STYLE — OVERALL LENGTH — SHAPE

ILEP 037 - 300 6 BL

SHANK — SIDE HOLE LOCATION

EJECTOR COMPONENTS						
Size	.020	.032	.046	.063	.094	.125
Part #	EJ2	EJ3	EJ4	EJ6	EJ9	EJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

For additional Ejector Components, see page 116.

HEAVY DUTY EJECTOR

Style Code	Shank Dia. [D]	Overall Length [L] 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	5.75	6.00	Side Hole Location [B]	Ejector
IHEP	.375 037																.50=2 .75=3 1.00=4 1.25=5 1.50=6	4 (.046)
	.500 050																	6 (.063)
	.625 062																	9 (.094)
	.750 075																	9 (.094)
	.875 087																	9 (.094)
	1.00 100																	9 (.094)
	1.25 125																	12 (.125)
Overall Length [L] Code		**250**	**275**	**300**	**325**	**350**	**375**	**400**	**425**	**450**	**475**	**500**	**525**	**550**	**575**	**600**		

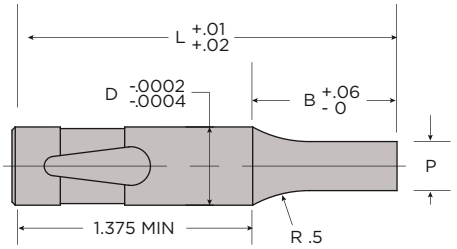
LIGHT DUTY EJECTOR

Style Code	Shank Dia. [D]	Overall Length [L] 2.00	2.25	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	5.75	6.00	Side Hole Location [B]	Ejector
ILEP	.250 025																		.50=2 .75=3 1.00=4 1.25=5 1.50=6	3 (.032)
	.375 037																			4 (.046)
	.500 050																			6 (.063)
	.625 062																			9 (.094)
	.750 075																			9 (.094)
	.875 087																			9 (.094)
	1.00 100																			9 (.094)
Overall Length [L] Code		**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**	**425**	**450**	**475**	**500**	**525**	**550**	**575**	**600**		

Stock available

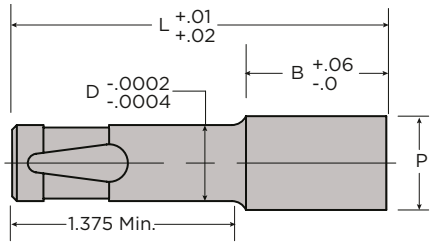
HEAVY DUTY SOLID PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4



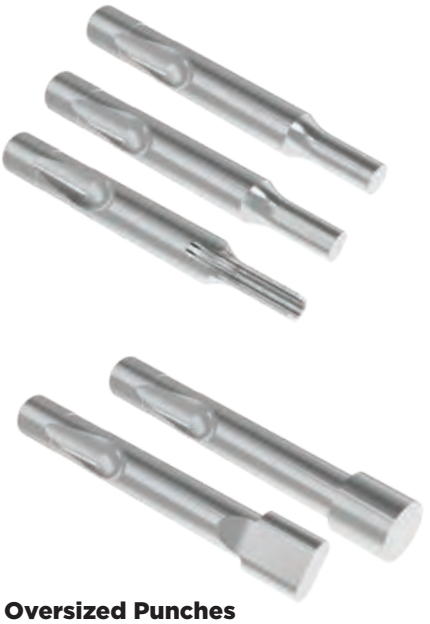
OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES ±.0005 Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4



Oversized punches can be ordered the same as our regular ball lock numbers.

Use **IHSO**— Impax Heavy Duty Oversized solid punch.



Oversized Punches

BALL LOCK

ORDER

ROUND

STYLE | SHANK | POINT LENGTH 'B' | 'P' DIM

IHSP 037 - 300 3 RD P=.250 Optima

OVERALL LENGTH | SHAPE | COATING

SHAPE

STYLE | SHANK | POINT LENGTH 'B' | 'P' DIM | KEY LOCATION

IHSP 050 - 275 5 OB P=.250 W=.200 Y180

OVERALL LENGTH | SHAPE | 'W' DIM

OVERSIZED

STYLE | SHANK | POINT LENGTH 'B' | 'P' DIM

IHSO 050 - 300 4 RD P=.550

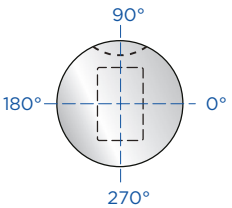
OVERALL LENGTH | SHAPE

ALTERATION OPTIONS	
ABR	Blend radius other than .500" [Round only]
AW	Smaller than standard "W" [Shapes]
PL	Precision overall length ±.001"

For additional Alteration Options, see page 114.

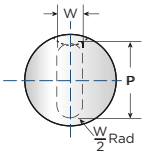
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°

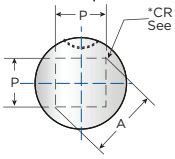


Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

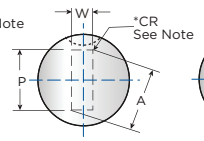
OB Obround



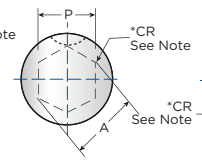
SQ Square



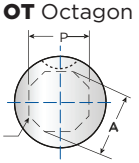
RT Rectangle



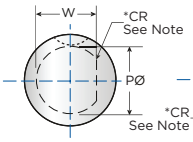
HX Hexagon



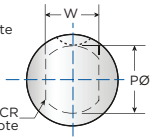
OT Octagon



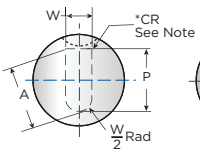
SD Single-D



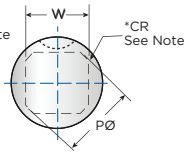
DD Double-D



LD Long-D



QD Quad-D



NOTES

Order Die View.

*.005 radius corners typical on shapes.

For special shapes see page 107.

HEAVY DUTY SOLID PUNCH

HEAVY DUTY SOLID — Style Code = IHSP

Shank Dia. [D]	Overall Length [L]															Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
	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	5.75	6.00				
.375 037	4	4	4	4	4	4	4									.50=2	.06	.09	.375
	4	4	4	4	4	4	4									.75=3			
	4	4	4	4	4	4	4									1.00=4			
		4	4	4	4	4	4									1.25=5	.09	.01	
			4	4	4	4	4									.150=6			
.500 050	4	4	4	4	4	4	4									.75=3	.09	.13	.5
	4	4	4	4	4	4	4									1.00=4			
		4	4	4	4	4	4									1.25=5			
			4	4	4	4	4									1.50=6	.12		
.625 062	4	4	4	4	4	4	4									.75=3	.18	.2	.625
	4	4	4	4	4	4	4									1.00=4			
		4	4	4	4	4	4									1.25=5			
			4	4	4	4	4									1.50=6	.23	.25	
.750 075	4	4	4	4	4	4	4									.75=3	.18	.2	.75
	4	4	4	4	4	4	4									1.00=4			
		4	4	4	4	4	4									1.25=5			
			4	4	4	4	4									1.50=6	.23	.25	
.875 087		4	4	4	4	4	4									.75=3	.21	.25	.875
		4	4	4	4	4	4									1.00=4			
		4	4	4	4	4	4									1.25=5			
			4	4	4	4	4									1.50=6	.3	.312	
1.00 100			4	4	4	4	4									.75=3	.21	.25	1
			4	4	4	4	4									1.00=4			
			4	4	4	4	4									1.25=5			
			4	4	4	4	4									1.50=6	.3	.312	
1.25 125			4	4	4	4	4									.75=3	.282	.282	1.25
			4	4	4	4	4									1.00=4			
			4	4	4	4	4									1.25=5			
			4	4	4	4	4									1.50=6	.3	.312	
Overall Length [L] Code	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600				

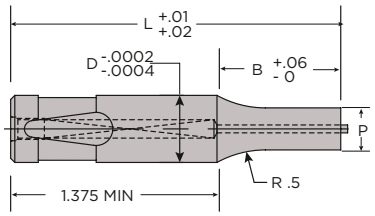
OVERSIZED HEAVY DUTY SOLID — Style Code = IHSO

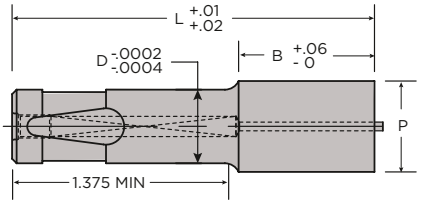
Shank Dia. [D]	Overall Length [L]							Point Length [B]	Absolute Min. P/W	Min. P/W
	2.50	2.75	3.00	3.25	3.50	3.75	4.00			
.375 037	4	4	4	4	4	4	4	.50=2	.06	.375
	4	4	4	4	4	4	4	.75=3		
	4	4	4	4	4	4	4	1.00=4		
		4	4	4	4	4	4	1.25=5	.09	
			4	4	4	4	4	.150=6		
.500 050	4	4	4	4	4	4	4	.75=3	.09	.5
	4	4	4	4	4	4	4	1.00=4		
		4	4	4	4	4	4	1.25=5		
			4	4	4	4	4	1.50=6	.12	
.625 062	4	4	4	4	4	4	4	.75=3	.18	.625
	4	4	4	4	4	4	4	1.00=4		
		4	4	4	4	4	4	1.25=5		
			4	4	4	4	4	1.50=6	.23	
.750 075	4	4	4	4	4	4	4	.75=3	.18	.75
	4	4	4	4	4	4	4	1.00=4		
		4	4	4	4	4	4	1.25=5		
			4	4	4	4	4	1.50=6	.23	
.875 087		4	4	4	4	4	4	.75=3	.21	.875
		4	4	4	4	4	4	1.00=4		
		4	4	4	4	4	4	1.25=5		
			4	4	4	4	4	1.50=6	.3	
1.00 100			4	4	4	4	4	.75=3	.21	1
			4	4	4	4	4	1.00=4		
			4	4	4	4	4	1.25=5		
			4	4	4	4	4	1.50=6	.3	
1.25 125			4	4	4	4	4	.75=3	.282	1.25
			4	4	4	4	4	1.00=4		
			4	4	4	4	4	1.25=5		
			4	4	4	4	4	1.50=6	.3	
Overall Length [L] Code	250	275	300	325	350	375	400			

Stock available 4 Ultima® M4 steel available

HEAVY DUTY EJECTOR PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, Ultima® M4





EJECTOR COMPONENTS

Size	.020	.032	.046	.063	.094	.125
Part #	EJ2	EJ3	EJ4	EJ6	EJ9	EJ12

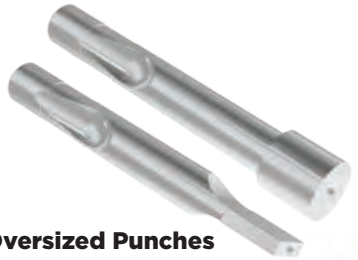
Replacement component set includes screw, spring and pin. Quantity: 10 each

Oversized punches can be ordered the same as our regular ball lock numbers.

Use **IHEO** — Impax Heavy Duty Oversized ejector punch.

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES ±.0005 Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

For additional Ejector Components, see page 116.



Oversized Punches

ORDER

ROUND

STYLE · SHANK · POINT LENGTH 'B' · 'P' DIM · COATING

IHEP 037 - 300 3 RD P=.250 Optima

OVERALL LENGTH · SHAPE

SHAPE

STYLE · SHANK · POINT LENGTH 'B' · 'P' DIM · KEY LOCATION

IHEP 050 - 275 5 OB P=.250 W=.200 Y180

OVERALL LENGTH · SHAPE · 'W' DIM

OVERSIZED

STYLE · SHANK · POINT LENGTH 'B' · 'P' DIM

IHEO 050 - 350 5 SQ P=.550

OVERALL LENGTH · SHAPE

EASY SHARP TOOL		
SIZE	CAT. NO.	FITS PIN NO.
.061	971481	4, 6, 9, 12
.031	971482	2, 3
Set	971562	

NOTES

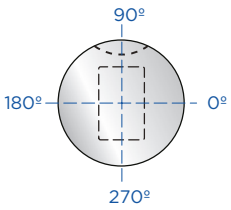
Order Die View.

*.005 radius corners typical on shapes.

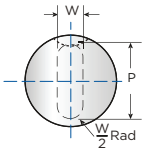
For special shapes see page 107.

SHAPES — DIE VIEW

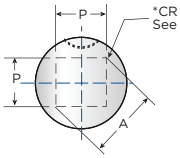
STANDARD KEY LOCATION IS 90° **OB** Obround



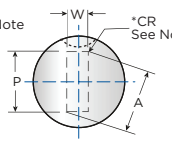
Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′



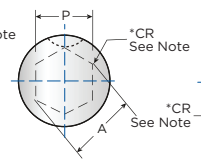
SQ Square



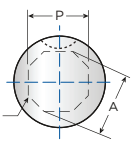
RT Rectangle



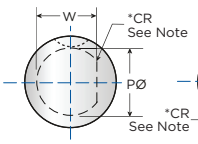
HX Hexagon



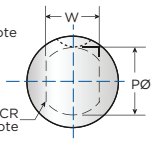
OT Octagon



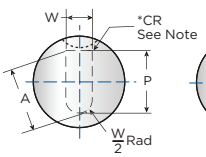
SD Single-D



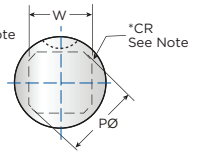
DD Double-D



LD Long-D



QD Quad-D



HEAVY DUTY EJECTOR PUNCH

HEAVY DUTY EJECTOR — Style Code = IHEP

Shank Dia. [D]	Overall Length [L]	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A	Ejector
.375 037	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, 5.75, 6.00	.50=2	.115	.12	.375	4 (.046)
	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, 5.75, 6.00	.75=3				
	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, 5.75, 6.00	1.00=4				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.25=5				
	3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.50=6				
.500 050	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	.75=3	.158	.165	.5	6 (.063)
	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, 5.75, 6.00	1.00=4				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.25=5				
	3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.50=6				
.625 062	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, 5.75, 6.00	.75=3	.235	.25	.625	9 (.094]
	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, 5.75, 6.00	1.00=4				
	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, 5.75, 6.00	1.25=5				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.50=6				
.750 075	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, 5.75, 6.00	.75=3	.235	.25	.75	9 (.094)
	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, 5.75, 6.00	1.00=4				
	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, 5.75, 6.00	1.25=5				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.50=6				
.875 087	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	.75=3	.235	.312	.875	9 (.094)
	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, 5.75, 6.00	1.00=4				
	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, 5.75, 6.00	1.25=5				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.50=6				
1.00 100	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	.75=3	.235	.312	1	9 (.094)
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.00=4				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.25=5				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.50=6				
1.25 125	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	.75=3	.282	.312	1.25	12 (.125)
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.00=4				
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.25=5				
	3.00, 3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00	1.50=6				
Overall Length [L] Code	250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 525, 550, 575, 600					

OVERSIZED HEAVY DUTY EJECTOR — Style Code = IHEO

Shank Dia. [D]	Overall Length [L]	Point Length [B]	Min. P/W	Ejector
.375 037	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.50=2	.375	4 (.046)
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.75=3		
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.00=4		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.25=5		
	3.00, 3.25, 3.50, 3.75, 4.00	.150=6		
.500 050	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.75=3	.5	6 (.063)
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.00=4		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.25=5		
	3.00, 3.25, 3.50, 3.75, 4.00	1.50=6		
.625 062	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.75=3	.625	9 (.094)
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.00=4		
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.25=5		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.50=6		
.750 075	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.75=3	.75	9 (.094)
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.00=4		
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.25=5		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.50=6		
.875 087	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.75=3	.875	9 (.094)
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.00=4		
	2.50, 2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.25=5		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.50=6		
1.00 100	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.75=3	1	9 (.094)
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.00=4		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.25=5		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.50=6		
1.25 125	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	.75=3	1.25	12 (.125)
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.00=4		
	2.75, 3.00, 3.25, 3.50, 3.75, 4.00	1.25=5		
	3.00, 3.25, 3.50, 3.75, 4.00	1.50=6		
Overall Length [L] Code	250, 275, 300, 325, 350, 375, 400			

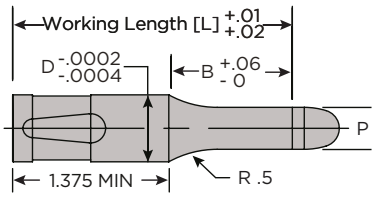
Stock available

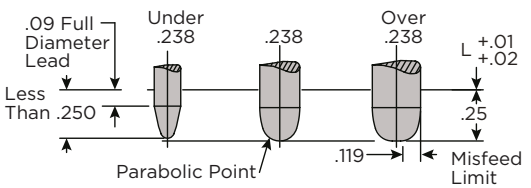
BALL LOCK

HEAVY DUTY PILOT PUNCH

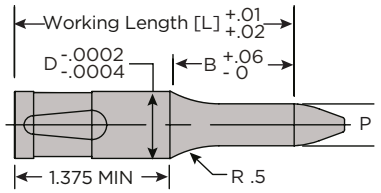
STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, Ultima® M4

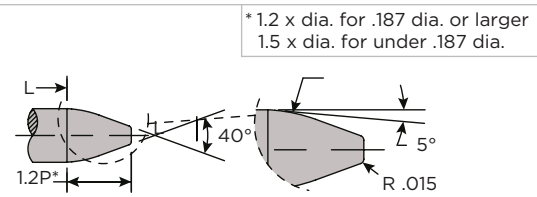
P1 STYLE PARABOLIC PILOT





P2 STYLE ANGULAR PILOT





OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS
+.0005
- 0
Point to Shank Concentric within .0005 T.I.R.

#2 ROUNDS
+.0002
- 0
Point to Shank Concentric within .0003 T.I.R.

Note: Shaped pilot punches available.

ORDER

STYLE | SHANK | POINT LENGTH 'B' | 'P' DIM

IHSP 062 - 350 4 RD P=.500 P1

WORKING LENGTH | SHAPE | PILOT STYLE

P1

P2

BALL LOCK

PILOT

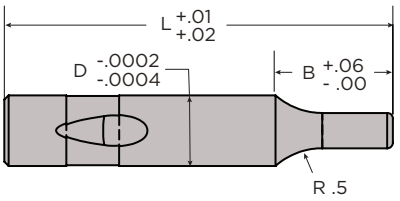
Style Code	Shank Dia. [D]	Working Length [L] 2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
IHSP	.375 037	4	4	4													.50=2	.06	.09	.375
		4	4	4													.75=3			
		4	4	4													1.00=4			
			4	4													1.25=5	.09	.1	
				4													1.50=6			
	.500 050	4	4	4													.75=3	.09	.13	.5
		4	4	4													1.00=4			
			4	4													1.25=5			
				4													1.50=6	.12		
	.625 062	4	4	4													.75=3	.18	.2	.625
		4	4	4													1.00=4			
			4	4													1.25=5			
				4													1.50=6	.23	.25	
	.750 075	4	4	4													.75=3	.18	.2	.75
		4	4	4													1.00=4			
			4	4													1.25=5			
				4													1.50=6	.23	.25	
	.875 087		4	4													.75=3	.21	.250	.875
			4	4													1.00=4			
			4	4													1.25=5			
				4													1.50=6	.3	.312	
	1.00 100			4													.75=3	.21	.25	1
				4													1.00=4			
				4													1.25=5			
				4													1.50=6	.3	.312	
	1.25 125			4													.75=3	.282	.282	1.25
				4													1.00=4			
				4													1.25=5			
				4													1.50=6	.3	.312	
Working Length [L] Code		250	275	300	325	350	375	400	425	450	475	500	525	550	575	600				

Stock available 4 Ultima® M4 steel available

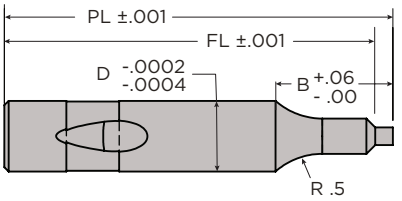
ROUND FORM PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V ULTIMA® M4

ROUND FORM WITHOUT 'FL' (FORM LENGTH)

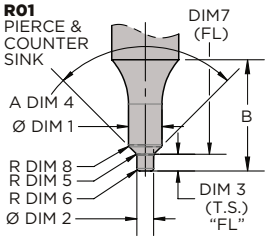


ROUND FORM WITH 'FL' (FORM LENGTH)
(All Round Form with 'FL' are PL)

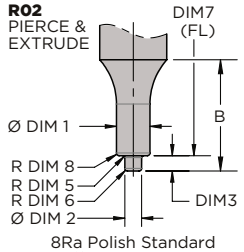


OPTIONAL TIP TOLERANCE [P]
TOLERANCE #1 +.0005 - 0 Concentric within .0005 T.I.R.
TOLERANCE #2 +.0002 - 0 Concentric within .0003 T.I.R.
OPTIONAL LENGTH TOLERANCE PL ±.001

R01 PIERCE & COUNTER SINK

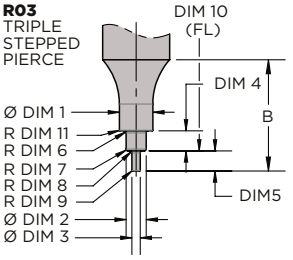


R02 PIERCE & EXTRUDE

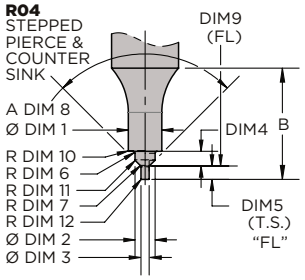


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

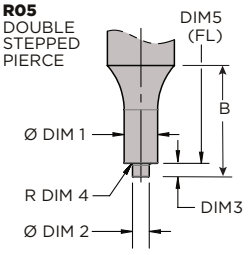
R03 TRIPLE STEPPED PIERCE



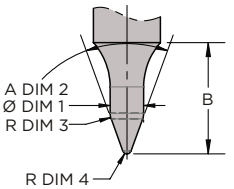
R04 STEPPED PIERCE & COUNTER SINK



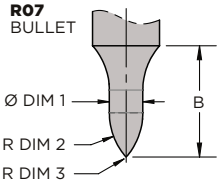
R05 DOUBLE STEPPED PIERCE



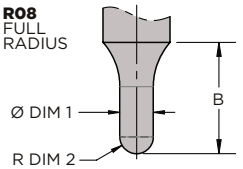
R06 CONE



R07 BULLET

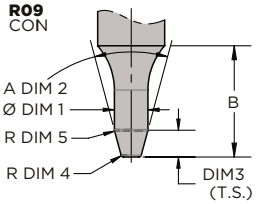


R08 FULL RADIUS

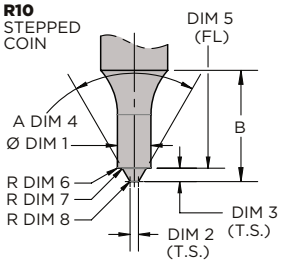


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

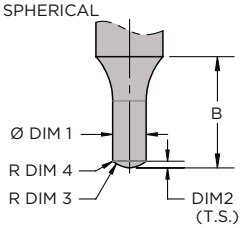
R09 CON



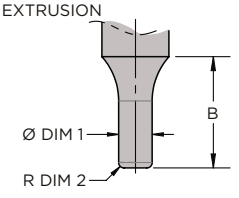
R10 STEPPED COIN



R11 SPHERICAL

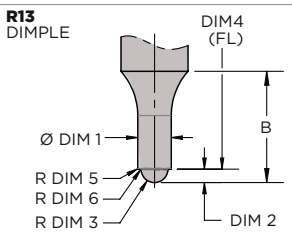


R12 EXTRUSION

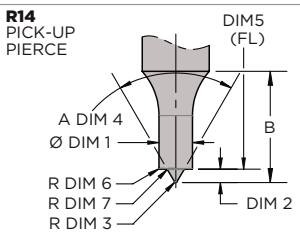


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

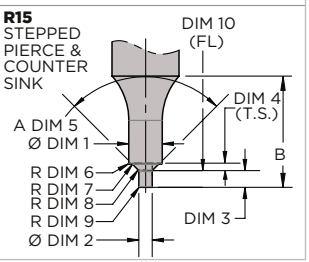
R13 DIMPLE



R14 PICK-UP PIERCE



R15 STEPPED PIERCE & COUNTER SINK

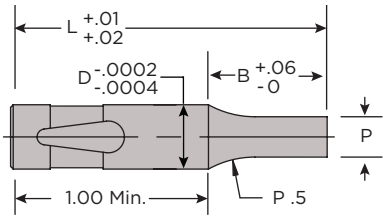


ORDER
Take standard catalog part number + round form part number.
EXAMPLE: ILSP050-3004 RO5 DIM. 1 DIM. 2 DIM. 3 DIM. 4 DIM. 5
All internal corners will have an internal radius of .010 minimum.

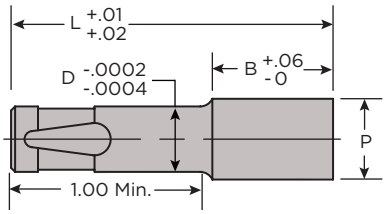
BALL LOCK

LIGHT DUTY SOLID PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4



STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4



Oversized punches can be ordered the same as our regular ball lock part numbers.
Use **ILSO** — Impax Light Duty Oversized solid punch.

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES ±.0005 Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

Oversized punches

ORDER

ROUND

STYLE ILSP | SHANK 037 | POINT LENGTH 'B' - 300 (OVERALL LENGTH) | 3 | RD (SHAPE) | 'P' DIM P=.250 | Optima (COATING)

SHAPE

STYLE ILSP | SHANK 050 | POINT LENGTH 'B' - 275 (OVERALL LENGTH) | 5 | OB (SHAPE) | 'P' DIM P=.250 | KEY LOCATION W=.200 ('W' DIM) YO

OVERSIZED

STYLE ILSO | SHANK 050 | POINT LENGTH 'B' - 300 (OVERALL LENGTH) | 4 | RD (SHAPE) | 'P' DIM P=.550

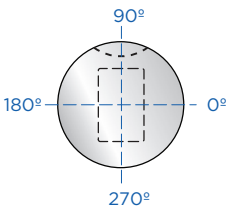
ALTERATION OPTIONS	
ABR	Blend radius other than .500" [Round only]
AW	Smaller than standard "W" [Shapes]
PL	Precision overall length ±.001"

For additional Alteration Options, see page 114.

NOTES
Order Die View.
*.005 radius corners typical on shapes.
For special shapes see page 107.

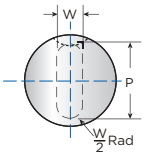
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°

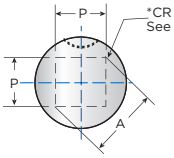


Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

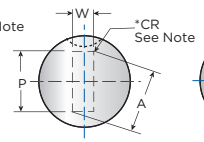
OB Obround



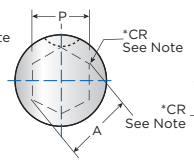
SQ Square



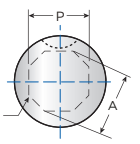
RT Rectangle



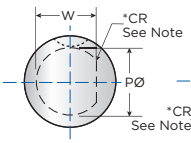
HX Hexagon



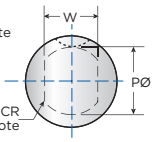
OT Octagon



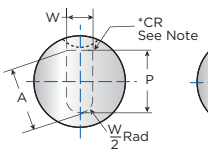
SD Single-D



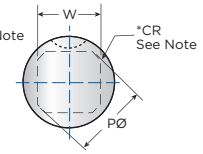
DD Double-D



LD Long-D



QD Quad-D



LIGHT DUTY SOLID PUNCH

LIGHT DUTY SOLID PUNCH — Style Code = ILSP

Shank Dia. [D]	Overall Length [L] 2.00	2.25	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	5.75	6.00	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
.250 025	4	4	4	4	4													.50=2	.04	.06	.25
	4	4	4	4	4													.75=3			
	4	4	4	4	4													1.00=4			
		4	4	4	4													1.25=5	.06	.09	
.375 037	4	4	4	4	4													.50=2	.06	.09	.375
	4	4	4	4	4													.75=3			
	4	4	4	4	4													1.00=4			
		4	4	4	4													1.25=5	.09	1	
.500 050	4	4	4	4	4													.75=3	.09	.13	.5
	4	4	4	4	4													1.00=4			
		4	4	4	4													1.25=5			
			4	4	4													1.50=6	.12		
.625 062		4	4	4	4													.75=3	.18	.2	.625
		4	4	4	4													1.00=4			
		4	4	4	4													1.25=5			
			4	4	4													1.50=6	.23	.25	
.750 075		4	4	4	4													.75=3	.18	.2	.75
		4	4	4	4													1.00=4			
		4	4	4	4													1.25=5			
			4	4	4													1.50=6	.23	.25	
.875 087			4	4	4													.75=3	.21	.250	.875
			4	4	4													1.00=4			
			4	4	4													1.25=5			
			4	4	4													1.50=6	.3	.312	
1.00 100			4	4	4													.75=3	.21	.25	1
			4	4	4													1.00=4			
			4	4	4													1.25=5			
			4	4	4													1.50=6	.3	.312	
Overall Length [L] Code	**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**	**425**	**450**	**475**	**500**	**525**	**550**	**575**	**600**				

OVERSIZED LIGHT DUTY SOLID PUNCH — Style Code = ILSO

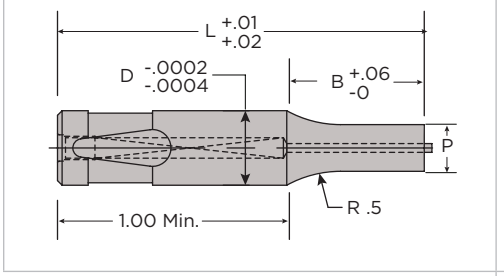
Shank Dia. [D]	Overall Length [L] 2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	Point Length [B]	Min. P/W
.250 025										.50=2	.250
										.75=3	
										1.00=4	
										1.25=5	
.375 037										.50=2	.375
										.75=3	
										1.00=4	
										1.25=5	
.500 050										.75=3	.500
										1.00=4	
										1.25=5	
										1.50=6	
.625 062										.75=3	.625
										1.00=4	
										1.25=5	
										1.50=6	
.750 075										.75=3	.750
										1.00=4	
										1.25=5	
										1.50=6	
.875 087										.75=3	.875
										1.00=4	
										1.25=5	
										1.50=6	
1.00 100										.75=3	1
										1.00=4	
										1.25=5	
										1.50=6	
Overall Length [L] Code	**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**		

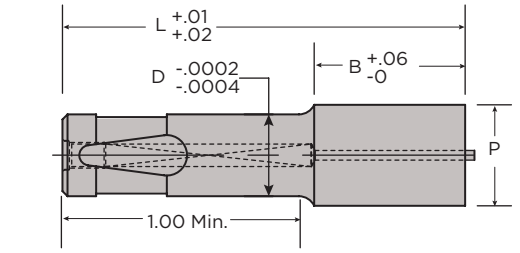
Stock available 4 Ultima® M4 steel available

BALL LOCK

LIGHT DUTY EJECTOR PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, Ultima® M4





OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#1 SHAPES ±.0005 Point to Shank Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.
Tolerance #1 unless specified

EJECTOR COMPONENTS						
Size	.020	.032	.046	.063	.094	.125
Part #	EJ2	EJ3	EJ4	EJ6	EJ9	EJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

Oversized punches can be ordered the same as our regular ball lock numbers.

Use **ILEO** — Impax Heavy Duty Oversized ejector punch.

For additional Ejector Components, see page 116.

Oversized punches

ORDER

ROUND

STYLE ILEP | SHANK 037 | OVERALL LENGTH - 300 | POINT LENGTH 'B' 3 | SHAPE RD | 'P' DIM P=.250 | COATING Optima

SHAPE

STYLE ILEP | SHANK 050 | OVERALL LENGTH - 275 | POINT LENGTH 'B' 5 | SHAPE OB | 'P' DIM P=.250 | 'W' DIM W=.200 | KEY LOCATION Y180

OVERSIZED

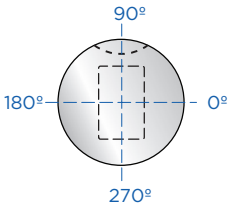
STYLE ILEO | SHANK 050 | OVERALL LENGTH - 350 | POINT LENGTH 'B' 5 | SHAPE SQ | 'P' DIM P=.550

EASY SHARP TOOL		
SIZE	**CAT. NO.**	**FITS PIN NO.**
.061	971481	4, 6, 9, 12
.031	971482	2, 3
Set	971562	

NOTES
Order Die View.
*.005 radius corners typical on shapes.
For special shapes see page 107.

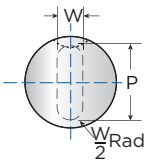
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°

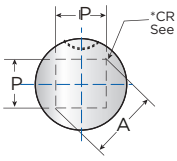


Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

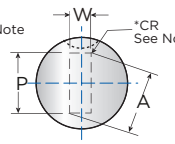
OB Obround



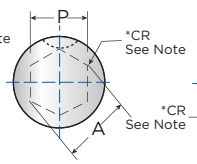
SQ Square



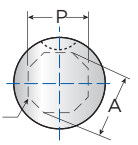
RT Rectangle



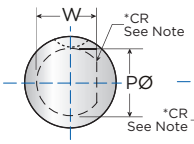
HX Hexagon



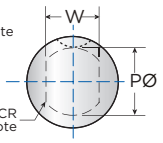
OT Octagon



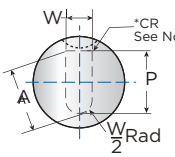
SD Single-D



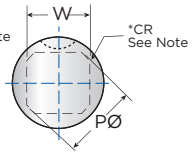
DD Double-D



LD Long-D



QD Quad-D



LIGHT DUTY EJECTOR PUNCH

LIGHT DUTY EJECTOR PUNCH — Style Code = ILEP

Shank Dia. [D]	Overall Length [L]	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A	Ejector
.250 025	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75	.50=2 .75=3 1.00=4	.058	.06	.25	3 (.032)
.375 037	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00 4.25 4.50	.50=2 .75=3 1.00=4 1.25=5	.115	.12	.375	4 (.046)
.500 050	2.00 2.25 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 5.75 6.00	.75=3 1.00=4 1.25=5 1.50=6	.518	.165	.5	6 (.063)
.625 062	2.00 2.25 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 5.75 6.00	.75=3 1.00=4 1.25=5 1.50=6	.235	.25	.625	9 (.094)
.750 075	2.00 2.25 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 5.75 6.00	.75=3 1.00=4 1.25=5 1.50=6	.235	.25	.75	9 (.094)
.875 087	2.00 2.25 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 5.75 6.00	.75=3 1.00=4 1.25=5 1.50=6	.235	.312	.875	9 (.094)
1.00 100	2.00 2.25 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 5.75 6.00	.75=3 1.00=4 1.25=5 1.50=6	.235	.312	1	9 (.094)
Overall Length [L] Code	200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600					

OVERSIZED LIGHT DUTY EJECTOR PUNCH — Style Code = ILEO

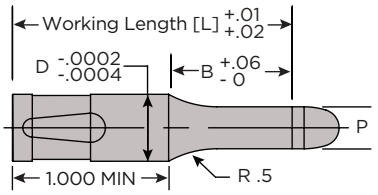
Shank Dia. [D]	Overall Length [L]	Point Length [B]	Min. P/W	Ejector
.250 025	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00	.50=2 .75=3 1.00=4	.250	3 (.032)
.375 037	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00	.50=2 .75=3 1.00=4 1.25=5	.375	4 (.046)
.500 050	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00	.75=3 1.00=4 1.25=5 1.50=6	.500	6 (.063)
.625 062	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00	.75=3 1.00=4 1.25=5 1.50=6	.625	9 (.094)
.750 075	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00	.75=3 1.00=4 1.25=5 1.50=6	.750	9 (.094)
.875 087	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00	.75=3 1.00=4 1.25=5 1.50=6	.875	9 (.094)
1.00 100	2.00 2.25 2.50 2.75 3.00 3.25 3.50 3.75 4.00	.75=3 1.00=4 1.25=5 1.50=6	1	9 (.094)
Overall Length [L] Code	200 225 250 275 300 325 350 375 400			

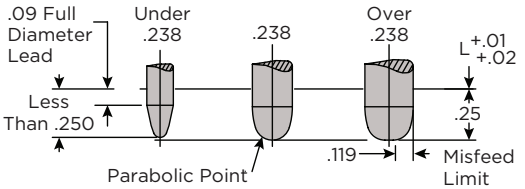
Stock available

LIGHT DUTY PILOT PUNCH

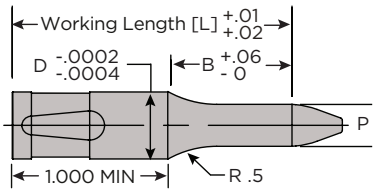
STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, Ultima® M4

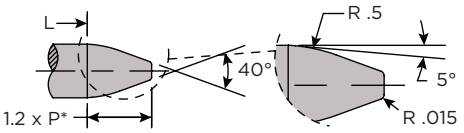
P1 STYLE PARABOLIC PILOT





P2 STYLE ANGULAR PILOT





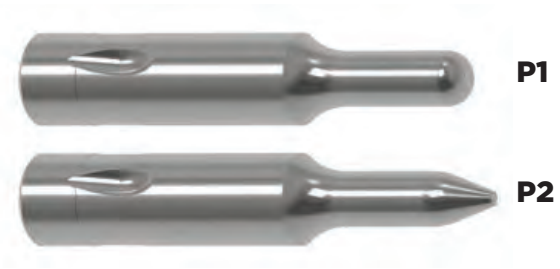
*1.2 x dia. for .187 dia. or larger
1.5 x dia. for under .187 dia.

ORDER

STYLE | SHANK | POINT LENGTH 'B' | 'P' DIM

ILSP 062 - 350 4 RD P=.500 P1

WORKING LENGTH | SHAPE | PILOT STYLE



P1

P2

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Point to Shank Concentric within .0005 T.I.R.
#2 ROUNDS +.0002 - 0 Point to Shank Concentric within .0003 T.I.R.

Note: Shaped pilot punches available.

LIGHT DUTY PILOT PUNCH

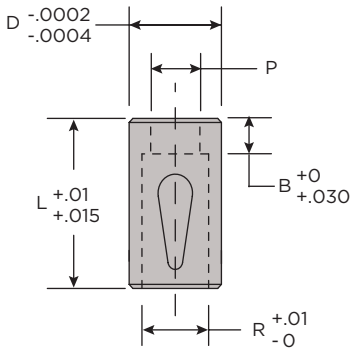
	Style Code	Shank Dia. [D]	Working Length [L] 200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	Point Length [B]	Absolute Min. P/W	Min. P/W	Max. P/A
SOLID	ILSP	.250 025	4	4	4	4														.50=2	.04	.06	.25
			4	4	4	4														.75=3			
			4	4	4	4														1.00=4			
				4	4	4														1.25=5	.06	.09	
		.375 037	4	4	4	4														.50=2	.06	.09	.375
			4	4	4	4														.75=3			
			4	4	4	4														1.00=4			
				4	4	4														1.25=5	.09	.1	
		.500 050	4	4	4	4														.75=3	.09	.13	.5
			4	4	4	4														1.00=4			
				4	4	4														1.25=5			
					4	4														1.50=6	.12		
		.625 062		4	4	4														.75=3	.18	.2	.625
				4	4	4														1.00=4			
				4	4	4														1.25=5			
					4	4														1.50=6	.23	.25	
		.750 075		4	4	4														.75=3	.18	.2	.75
				4	4	4														1.00=4			
				4	4	4														1.25=5			
					4	4														1.50=6	.23	.25	
		.875 087			4	4														.75=3	.21	.250	.875
					4	4														1.00=4			
					4	4														1.25=5			
					4	4														1.50=6	.3	.312	
		1.00 100			4	4														.75=3	.21	.25	1
					4	4														1.00=4			
					4	4														1.25=5			
					4	4														1.50=6	.3	.312	
	Working Length [L] Code		200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600				

Stock available 4 Ultima® M4 steel available

BALL LOCK

COUNTERBORE RELIEF DIE

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, Ultima® M4



Also available with taper relief.

BLANKS: Available with .04" dia. start hole. Start hole concentric to body within .005" and contains a counterbore.

OPTIONAL HOLE TOLERANCE [P]
#1 ROUNDS +.0005 - 0 Hole to Body Concentric within .0005 T.I.R.
#1 SHAPES +.001 - 0 Hole to Body Concentric within .001 T.I.R.
#2 ROUNDS & SHAPES +.0002 - 0 Hole to Body Concentric within .0003 T.I.R.
Tolerance #1 unless specified

ORDER

ROUND

STYLE SHANK SHAPE 'P' DIM
ILBD 050 - 118 RD P=.175
OVERALL LENGTH

SHAPE

STYLE SHANK SHAPE 'P' DIM 'W' DIM SLUG HUGGER TOTAL CLEARANCE
ILBD 075 - 118 OB P=.325 W=.250 SH2 CLR=.010
OVERALL LENGTH
MAT=Mild Steel MT= 12g
MATERIAL TYPE MATERIAL THICKNESS

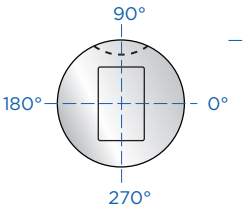
ALTERATION OPTIONS

ADL	Altered die land (smaller)
PL	Precision Overall Length ±.001"
SH2	Slug Hugger®2

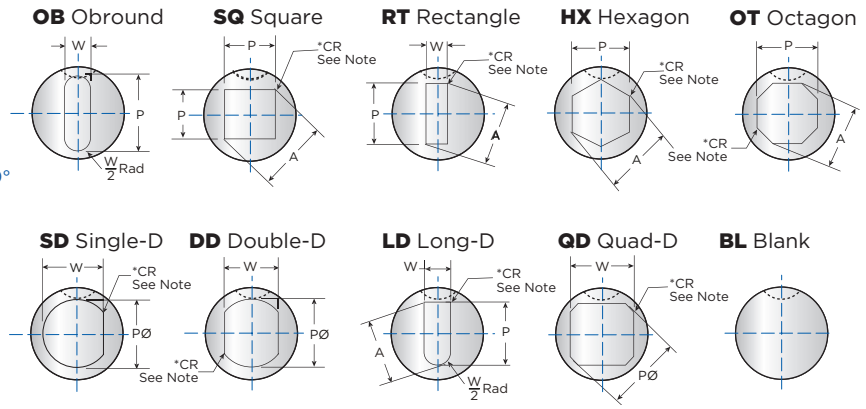
For additional Alteration Options, see page 114.

SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°



Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′



NOTES

Order Die View.

*.007 radius corners typical on shapes.

For special shapes see page 107.

BALL LOCK

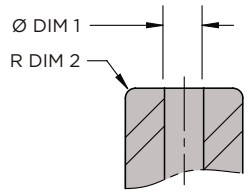
Style Code	Shank Dia. [D]	Length (L)	Absolute Min. P/W	Min. P	Max. P	Max. P/A	Relief Dia. [R]	Die Land [B]
ILBD	.500 050	1.1875 118	.032	.062	.062	.195	.228	.156
	.625 062			.093	.093	.285	.312	.187
	.750 075			.118	.118	.345	.375	.187
	.875 087			.125	.125	.435	.468	.25
	1.00 100			.156	.156	.545	.578	.25
	1.25 125			.187	.187	.655	.687	.25
	1.50 150			.25	.25	.780	.812	.312
	1.75 175			.25	.25	1.035	1.062	.34

Note: Longer lengths available upon request.

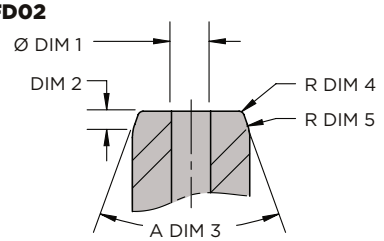
ROUND FORM DIE

STANDARD MATERIAL M2 60-63 HRC — ALTERNATE MATERIALS M4, 10V, 3V, ULTIMA® M4

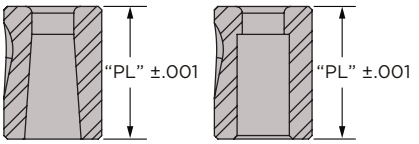
FD01



FD02

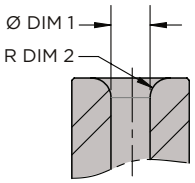


ALSO AVAILABLE WITH TAPER OR COUNTERBORE RELIEF



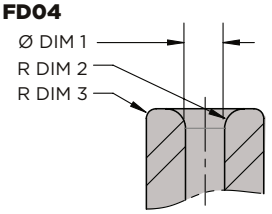
Offer 8Ra, 6Ra & 4Ra Polish

FD03



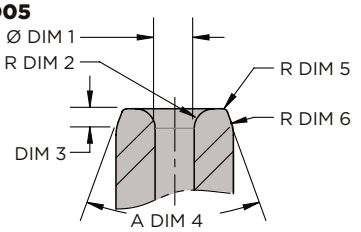
"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD04



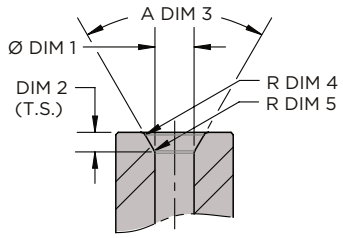
"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD05

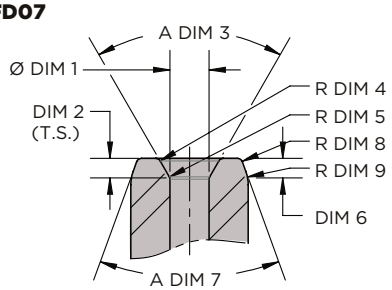


"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

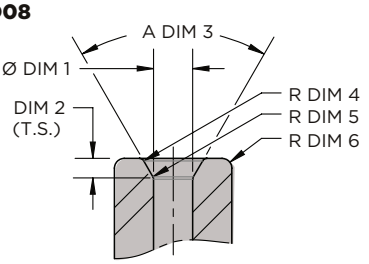
FD06



FD07



FD08



ORDER

Take standard catalog part number plus round tip part number.

EXAMPLE:

ILBD100-118 FD03

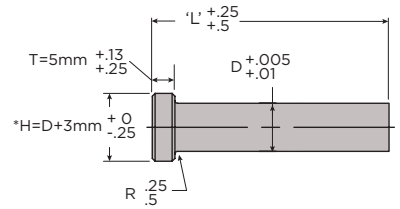
DIM. 1

DIM. 2

OPTIONAL HOLE TOLERANCE [P]
TOLERANCE #1 +.0005 - 0 Hole to Body Concentric within .0005 T.I.R.
TOLERANCE #2 +.0002 - 0 Hole to Body Concentric within .0003 T.I.R.

SOLID BLANKS

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, Ultima® M4



Punch Head drawn to 40-50 HRC up to 25mm dia.

*H=Head Diameter

ORDER

STYLE — OVERALL LENGTH

MSPB 10 - 80 BL

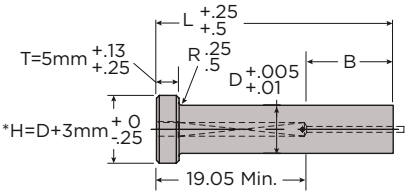
SHANK — SHAPE

	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L]											
				32	40	45	50	56	60	63	70	71	80	90	100
SOLID	MSPB	5	4 04												
			5 05												
			6 06												
			8 08												
			10 10												
			13 13												
			16 16												
			20 20												
			25 25												
			32 32												
			40 40												
			45 45												
			50 50												
			56 56												
			63 63												
	Overall Length [L] Code			32	40	45	50	56	60	63	70	71	80	90	100

Stock available

EJECTOR BLANKS

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, Ultima® M4



Punch Head drawn to 40-50 HRC up to 25mm dia.

*H=Head Diameter

EJECTOR COMPONENTS

Size	.38	.69	1.04	1.47	2.26	3.05
Part #	MEJ2	MEJ3	MEJ4	MEJ6	MEJ9	MEJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

For additional Ejector Components, see page 117.

ORDER

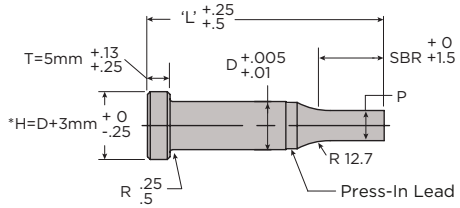
STYLE SHANK SIDE HOLE LOCATION
MEPB 16 - 80 25 BL
OVERALL LENGTH SHAPE

EJECTOR	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 32	40	45	50	56	60	63	70	71	80	90	100	Side Hole Location [B]	Ejector
	MEPB	5	5 / 05													8 13 19 25	2 (.38)
			6 / 06														3 (.69)
			8 / 08														4 (1.04)
			10 / 10														6 (1.47)
			13 / 13														6 (1.47)
			16 / 16														9 (2.26)
			20 / 20														9 (2.26)
			25 / 25														9 (2.26)
			32 / 32														12 (3.05)
			40 / 40														12 (3.05)
			45 / 45														12 (3.05)
			50 / 50														12 (3.05)
			56 / 56														12 (3.05)
			63 / 63														12 (3.05)
	Overall Length [L] Code			32	40	45	50	56	60	63	70	71	80	90	100		

Stock available

SOLID PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, Ultima® M4



Punch Head drawn to 40-50 HRC

*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013 Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

ORDER

ROUND

STYLE SHANK SBR 'P' DIM

MSPB 10 - 80 19 RD P=6.35 Optima

OVERALL LENGTH — SHAPE — COATING

SHAPE

STYLE SHANK SBR 'P' DIM KEY TYPE

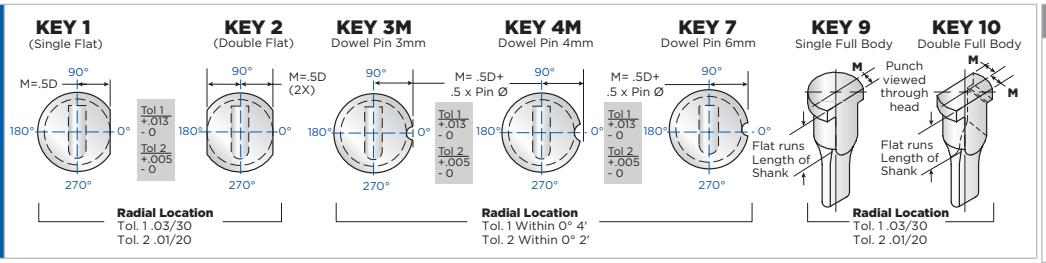
MSPB 13 - 71 25 OB P=10 W=5.0 K1 Y90

OVERALL LENGTH — SHAPE — 'W' DIM — KEY ANGLE

ALTERATION OPTIONS	
ABR	Blend radius other than 12.7mm [Round only]
ABRD	Point length longer than standard [Round]
ABSH	Point length longer than standard [Shape]
AD	Reduce body diameter
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
EBT	Extra back taper
MK	Multiple keys
PL	Precision Overall Length ±.026mm
PT	Precision head thickness ±.013mm

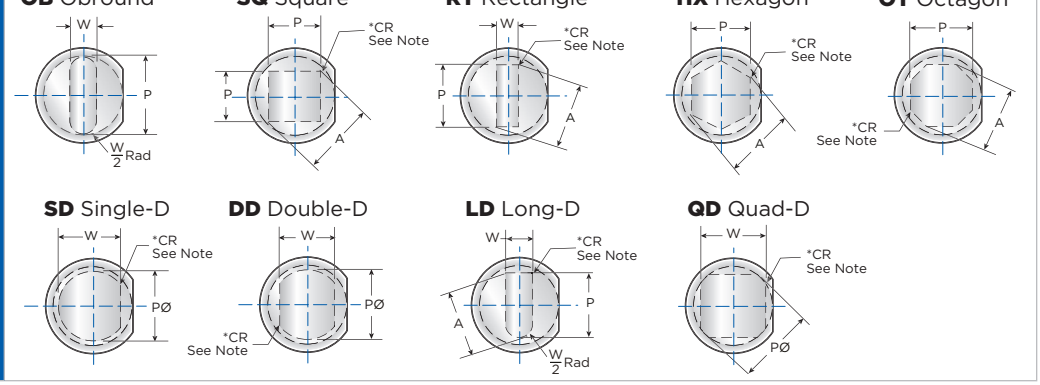
For additional Alteration Options, see page 114.

KEYS



NOTES
• **Key 1-7** included in all standard shapes price.
• Standard 'M' dim. for **Key 9 & 10** is .5D Dia.– 1.5
• Alterations to keying, see page 119.
• Standard key angle 'Y'=0.

SHAPES — DIE VIEW



NOTES
Order Die View.
*.13 radius corners typical on shapes.
For special shapes see page 107.

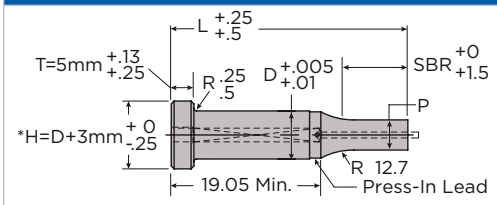
SOLID PUNCH

	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 32	40	45	50	56	60	63	70	71	80	90	100	SBR	Min. P	Min. W	Max. P/A
SOLID	MSPB	5	4 04													8	1.5	.75	4
																13		1.5	
																19			
																25		2.25	
			5 05													8	1.5	1.5	5
																13			
																19		2.25	
																25		2.5	
			6 06													8	3.25	1.5	6
																13			
																19		2.25	
																25		2.5	
			8 08													8	4.25	2.25	8
																13			
																19		2.5	
																25			
			10 10													8	4.25	2.25	10
																13			
																19		2.5	
																25			
			13 13													13	4.25	3.25	13
																19			
																25			
			16 16													13	6.25	5	16
																19			
																25		6.25	
			20 20													13	6.25	5	20
																19			
																25		6.25	
			25 25													13	8	6.25	25
																19			
																25		7.75	
	Overall Length [L] Code			32	40	45	50	56	60	63	70	71	80	90	100				

Stock available

HEADED

EJECTOR PUNCH

STANDARD MATERIAL M4 62-64 HRC ALTERNATE MATERIALS 10V, 3V, Ultima® M4
 Punch Head drawn to 40-50 HRC
*H=Head Diameter

EJECTOR COMPONENTS						
Size	.38	.69	1.04	1.47	2.26	3.05
Part #	MEJ2	MEJ3	MEJ4	MEJ6	MEJ9	MEJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013 Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

For additional Ejector Components, see page 117.

ORDER

ROUND

STYLE SHANK SBR 'P' DIM COATING

MEPB 16 - 80 25 RD P=12.7 TOL2 Optima

OVERALL LENGTH — SHAPE — TOLERANCE

SHAPE

STYLE SHANK SBR 'P' DIM KEY ANGLE

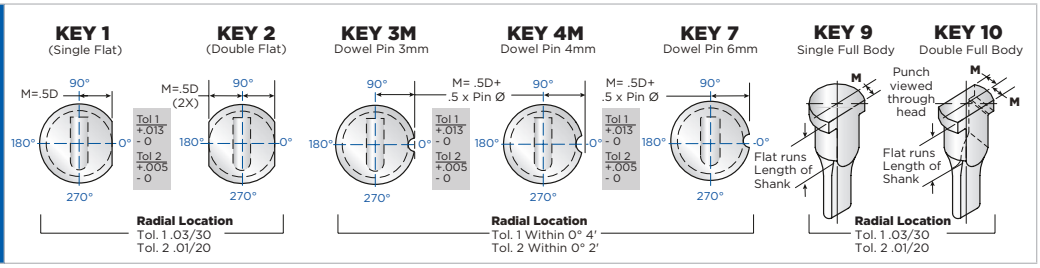
MEPB 25 - 100 25 SQ P=9.52 K1 Y90

OVERALL LENGTH — SHAPE — KEY TYPE

ALTERATION OPTIONS	
ABR	Blend radius other than 12.7mm [Round only]
ABRD	Point length longer than standard [Round]
ABSH	Point length longer than standard [Shape]
AD	Reduce body diameter
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head Thickness
EBT	Extra back taper
MK	Multiple keys
NS	No side hole — ejector
PL	Precision Overall Length ±.026mm
PT	Precision head thickness ±.013mm

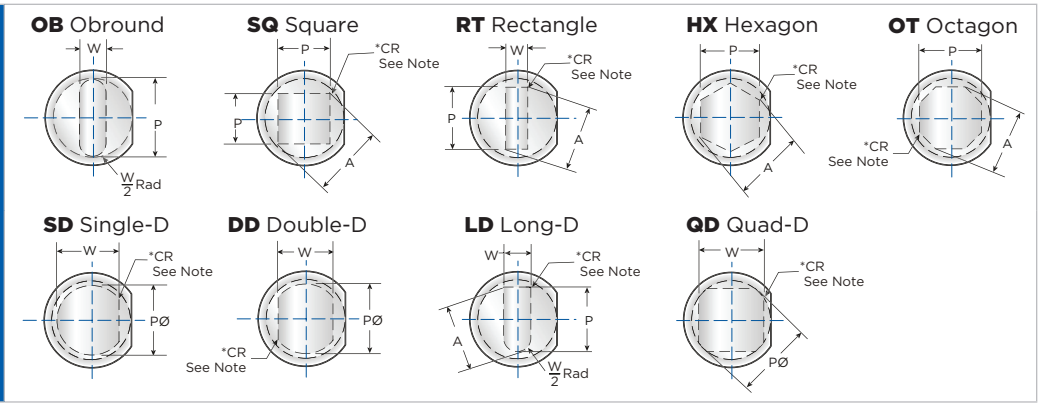
For additional Alteration Options, see page 114.

KEYS



NOTES
• **Key 1-7** included in all standard shapes price. • Standard 'M' dimension for **Key 9 & 10** is .5D Dia.–.1.5. • Alterations to keying, see page 119. • Standard key angle 'Y'=0.

SHAPES — DIE VIEW



NOTES
Order Die View. *.13 radius corners typical on shapes. For special shapes see page 107.

EJECTOR PUNCH

EJECTOR	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 32	40	45	50	56	60	63	70	71	80	90	100	SBR	Min. P	Min. W	Max. P/A	Ejector
	MEPB	5	5 05													8	1.5	1.5	5	2 (.38)
																13		1.5		
																19		2.25		
			6 06													8	3.25	1.5	6	3 (.69)
																13		1.5		
																19		2.25		
																25		2.5		
			8 08													13	4.25	2.25	8	4 (1.04)
																19		2.5		
																25		2.5		
			10 10													13	4.25	2.25	10	6 (1.47)
																19		2.25		
																25		2.5		
			13 13													13	4.25	3.25	13	6 (1.47)
																19				
																25				
			16 16													13	6.25	5	16	9 (2.26)
																19		5		
																25		6.25		
			20 20													13	6.25	5	20	9 (2.26)
																19		5		
																25		6.25		
			25 25													13	8	6.25	25	9 (2.26)
																19		6.25		
																25		7.75		
	Overall Length [L] Code			32	40	45	50	56	60	63	70	71	80	90	100					

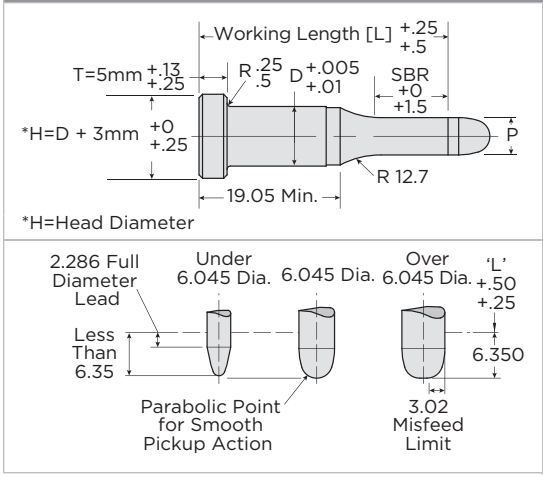
Stock available

EASY SHARP TOOL		
SIZE	CAT. NO.	FITS PIN NO.
1.5	971481	4, 6, 9, 12
.78	971482	2, 3
Set	971562	

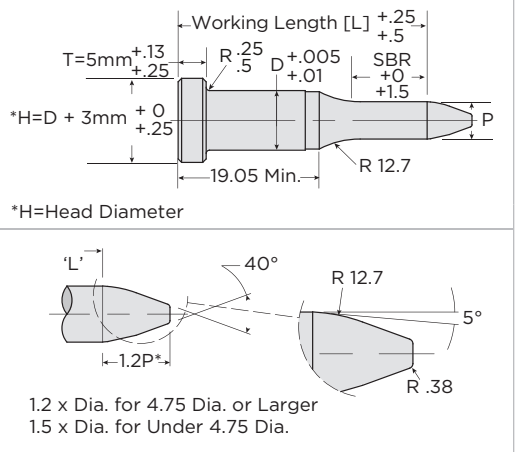
PILOT PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4

P1 STYLE — PARABOLIC PILOT



P2 STYLE — ANGULAR PILOT



OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS
+.013
- 0
Point to Shank Concentric within .013 T.I.R.

#2 ROUNDS
+.005
- 0
Point to Shank Concentric within .008 T.I.R.

Note: Shaped pilot punches available.

ORDER

STYLE — SHANK — SBR — 'P' DIM

MSPB 16 90 25 RD P=12.7 P1

WORKING LENGTH — SHAPE — PILOT TYPE

PILOT

Style Code	Head THK [T]	Shank Dia. [D]	Working Length [L] 32	40	45	50	56	60	63	70	71	80	90	100	SBR	Min. P
MSPB	5	4 / 04													8	1.5
															13	
															19	
															25	
		5 / 05													8	1.5
															13	
															19	
															25	
		6 / 06													8	3.25
															13	
															19	
															25	
		8 / 08													8	4.25
															13	
															19	
															25	
		10 / 10													8	4.25
															13	
															19	
															25	
		13 / 13													13	4.25
															19	
															25	
		16 / 16													13	6.25
															19	
															25	
		20 / 20													13	6.25
															19	
															25	
		25 / 25													13	8
															19	
															25	
Working Length [L] Code			**32**	**40**	**45**	**50**	**56**	**60**	**63**	**70**	**71**	**80**	**90**	**100**		

Stock available

ALTERATION OPTIONS

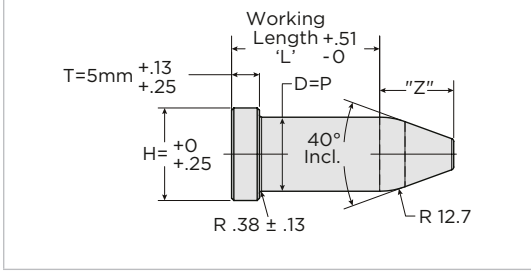
ABR	Blend radius other than 12.7mm [Round only]
ABRD	Point length longer than standard [Round]
ABSH	Point length longer than standard [Shape]
AD	Reduce body diameter
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
PT	Precision head thickness ±.013mm

For additional Alteration Options, see page 114.

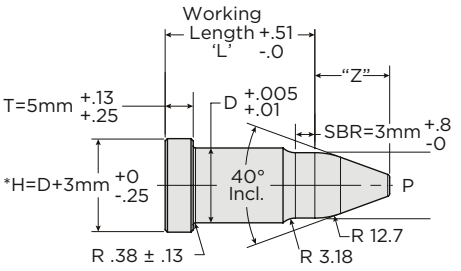
STUBBY PILOT PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, Ultima® M4

STRAIGHT



POINT



*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]

TOLERANCE #1
+.013
- 0
Point to Shank Concentric within .013 T.I.R.

TOLERANCE #2
+.005
- 0
Point to Shank Concentric within .008 T.I.R.

ORDER

STRAIGHT

STYLE | SHANK | SHAPE | PILOT STYLE

MSS B 06 - 25 RD D=5.05 P3

HEAD THICKNESS | WORKING LENGTH | 'D' DIM

POINT

STYLE | SHANK | SHAPE | PILOT STYLE

MSP B 08 - 32 RD P=4.55 P3 AL=30.8

HEAD THICKNESS | WORKING LENGTH | 'P' DIM | ALT. LENGTH

MSSB [P3]

MSPB [P3]

STRAIGHT

Style Code	Head THK [T]	Shank Dia. [D]	Shank Code	Working Length [L] 16	20	22	25	28	32	35	[Z]*	Min. D	Max. D	Head Dia. [H]
MSSB	5	4	04								4	1.50	4	7
		5	05								5	4.01	5	8
		6	06								6	5.01	6	9
		8	08								8	6.01	8	11
		10	10								10	8.01	10	13
		13	13								13	10.01	13	16
		16	16								16	13.01	16	19
		20	20								20	16.01	20	23
		25	25								25	20.01	25	28
Working Length [L] Code				**16**	**20**	**22**	**25**	**28**	**32**	**35**				

* Z=3.35 + [(P – 1.45) ÷ .728]

ALTERATION OPTIONS

AH Altered head diameter
AL Overall length shorter [Shorten shank maintain point]
AT Altered head thickness
PT Precision head thickness ±.013mm

For additional Alteration Options, see page 114.

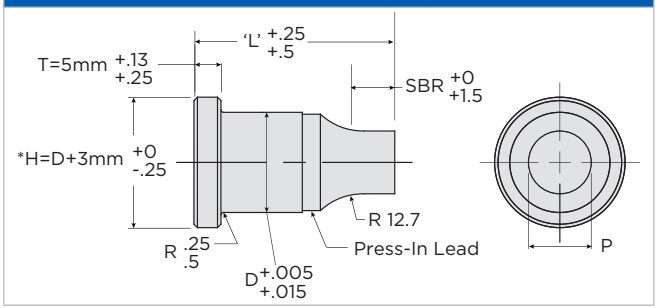
POINT

Style Code	Head THK [T]	Shank Dia. [D]	Shank Code	Working Length [L] 16	20	22	25	28	32	35	SBR	Max. [Z]	Min. P	Max. P
MSPB	5	4	04								3	4	2.5	3.99
		5	05									5	2.5	4.99
		6	06									6	2.5	5.99
		8	08									8	2.5	7.99
		10	10									10	3.5	9.99
		13	13									13	5	12.99
		16	16									16	12	15.99
		20	20									20	13	19.99
		25	25									25	13	24.99
Working Length [L] Code				**16**	**20**	**22**	**25**	**28**	**32**	**35**				

Stock available

EXTENDED RANGE PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, Ultima® M4



*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]	
#1 ROUNDS +.013 - 0	Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013	Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0	Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified	

No head draw on extended range.
No side hole on extended range.

ALTERATION OPTIONS	
ABR	Blend radius other than 12.7mm [Round only]
ABRD	Point length longer than standard [Round]
ABSH	Point length longer than standard [Shape]
AD	Reduce body diameter
AE	Ejector size — different than standard for punch
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
EBT	Extra back taper
MK	Multiple keys
PL	Precision Overall Length ±.026mm
PT	Precision head thickness ±.013mm

For additional Alteration Options, see page 114.

ORDER

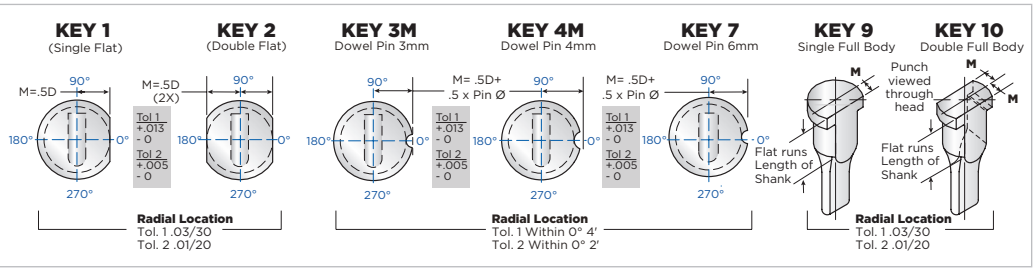
ROUND

STYLE SHANK SBR 'P' DIM
MSPB 40 - 70 25 RD P=20 Optima
OVERALL LENGTH · SHAPE · COATING

SHAPE

STYLE SHANK SBR 'P' DIM KEY TYPE
MSPB 32 - 70 19 OB P=25 W=15 K1 Y90
OVERALL LENGTH · SHAPE · 'W' DIM · KEY ANGLE

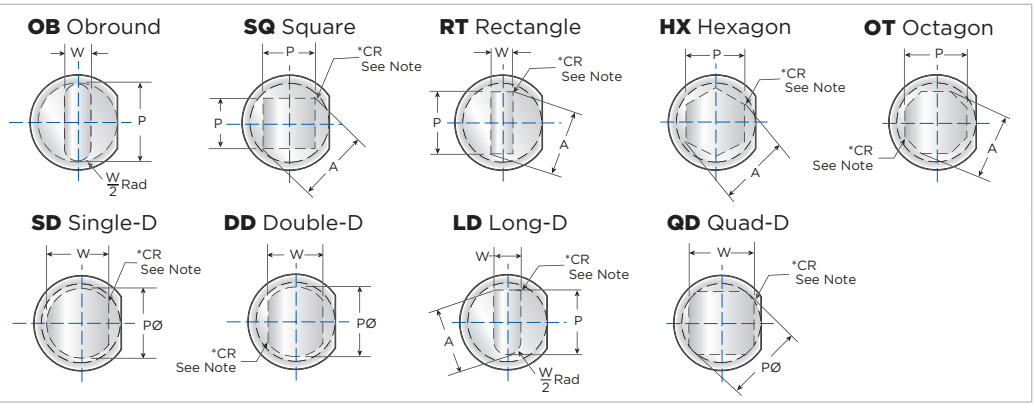
KEYS



NOTES

- **Key 1-7** included in all standard shapes price.
- Standard 'M' dim. for **Key 9 & 10** is .5D Dia. – 1.5.
- Alterations to keying, see page 119.
- Standard key angle 'Y'=0.

SHAPES — DIE VIEW



NOTES

Order Die View.

*.013 radius corners typical on shapes.

For special shapes see page 107.

EXTENDED RANGE PUNCH

SOLID

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 32	40	45	50	56	60	63	70	71	80	90	100	SBR	Min. P	Min. W	Max. P/A
MSPB	5	32 32													19	8.5	7	32
															25			
															30			
		40 40													19	14	7.5	40
															25			
															30			
		45 45													19	25	9	45
															25			
															30			
		50 50													19	30	10	10
															25			
															30			
		56 56													19	35	11.5	56
															25			
															30			
		63 63													19	41	13	63
															25			
															30			
Overall Length [L] Code			32	40	45	50	56	60	63	70	71	80	90	100				

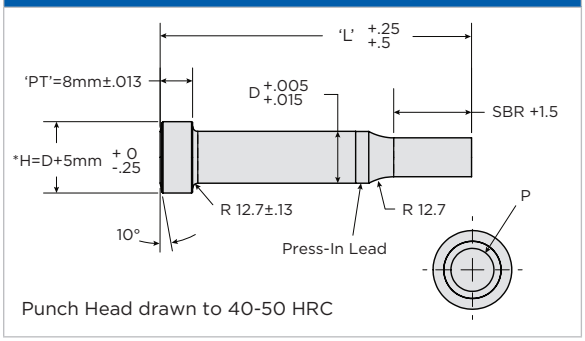
EJECTOR

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 40	45	50	56	60	63	70	71	80	90	100	SBR	Min. P	Min. W	Max. P/A	Ejector
MEPB	5	32 32												19	8.5	7	32	12 (3.05)
														25				
														30				
		40 40												19	14	7.5	40	12 (3.05)
														25				
														30				
		45 45												19	25	9	45	12 (3.05)
														25				
														30				
		50 50												19	30	10	10	12 (3.05)
														25				
														30				
		56 56												19	35	11.5	56	12 (3.05)
														25				
														30				
		63 63												19	41	13	63	12 (3.05)
														25				
														30				
Overall Length [L] Code			40	45	50	56	60	63	70	71	80	90	100					

Stock available

XTREME PUNCH

STANDARD MATERIAL Ultima® M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V



Punch Head drawn to 40-50 HRC

*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013 Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

ORDER

ROUND

STYLE SHANK SBR 'P' DIM COATING

MSP X 16 - 80 25 RD P=12.7 TOL2 Optima

HEAD THICKNESS · OVERALL LENGTH · SHAPE · TOLERANCE

SHAPE

STYLE SHANK SBR 'P' DIM KEY STYLE

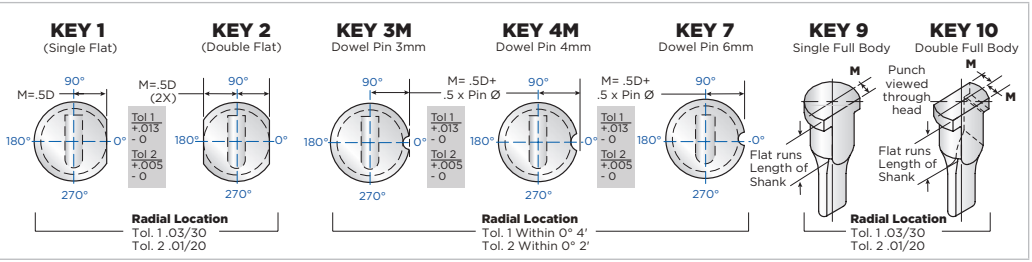
MEP X 25 - 100 25 RT P=9.52 W=7.0 K1 Y45

HEAD THICKNESS · OVERALL LENGTH · SHAPE · 'W' DIM · KEY ANGLE

ALTERATION OPTIONS	
ABR	Blend radius other than 12.7mm [Round only]
ABRD	Point length longer than standard [Round]
ABSH	Point length longer than standard [Shape]
AD	Reduce body diameter
AL	Overall length shorter [Shorten shank maintain point]
EBT	Extra back taper
MK	Multiple keys
PL	Precision Overall Length ±.026mm

For additional Alteration Options, see page 114.

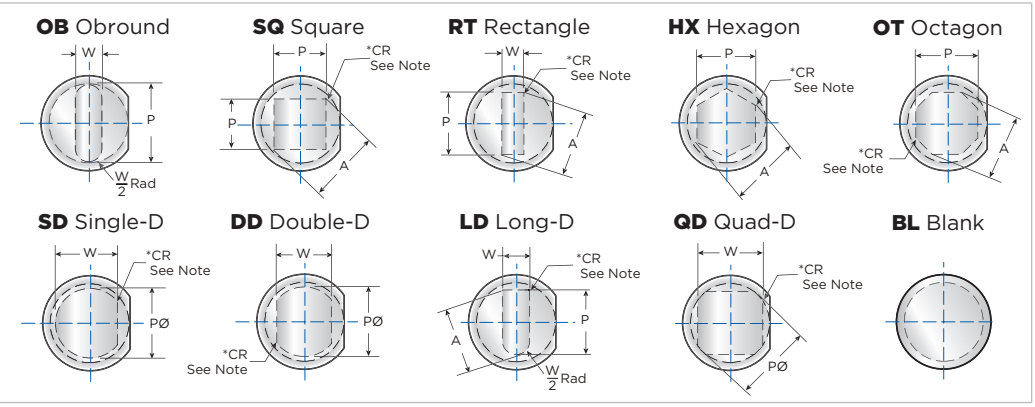
KEYS



NOTES

- **Key 1-7** included in all standard shapes price.
- Standard 'M' dim. for **Key 9 & 10** is .5D Dia. – 1.5.
- Alterations to keying, see page 119.
- Standard key angle 'Y'=0.

SHAPES — DIE VIEW



NOTES

Order Die View.

*.13 radius corners typical on shapes.

For special shapes see page 107.

XTREME PUNCH

	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 50	60	70	80	90	100	110	120	SBR	Min. P/W	Max. P/A
SOLID	MSPX	8	10 10		4	4	4	4	4			13	2	10
						4	4	4	4			19		
							4	4	4			25		
			13 13		4	4	4	4	4			13	3	13
						4	4	4	4			19		
							4	4	4			25		
			16 16		4	4	4	4	4			13	3	16
						4	4	4	4			19		
							4	4	4			25		
			20 20		4	4	4	4	4			13	5	20
						4	4	4	4			19		
							4	4	4			25		
			25 25		4	4	4	4	4			13	6	25
						4	4	4	4			19		
							4	4	4			25	9	
	Overall Length [L] Code			50	60	70	80	90	100	110	120			

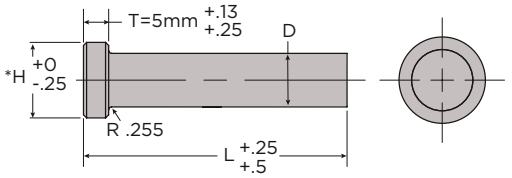
	Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 50	60	70	80	90	100	110	120	SBR	Min. P/W	Max. P/A	Ejector
EJECTOR	MEPX	8	10 10		4	4	4	4	4			13	4	10	6 (1.47)
						4	4	4	4			19			
							4	4	4			25			
			13 13		4	4	4	4	4			13	4	13	6 (1.47)
						4	4	4	4			19			
							4	4	4			25			
			16 16		4	4	4	4	4			13	6	16	9 (2.26)
						4	4	4	4			19			
							4	4	4			25			
			20 20		4	4	4	4	4			13	6	20	9 (2.26)
						4	4	4	4			19			
							4	4	4			25			
			25 25		4	4	4	4	4			13	8	25	9 (2.26)
						4	4	4	4			19			
							4	4	4			25			
	Overall Length [L] Code			50	60	70	80	90	100	110	120				

Stock available 4 Ultima® M4 steel available

HEADED

STRAIGHT PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, Ultima® M4



Punch Head drawn to 40-50 HRC *H=Head Diameter

OPTIONAL TOLERANCE [D]
TOLERANCE #1 +.013 - 0 Concentric within .013 T.I.R.
TOLERANCE #2 +.005 - 0 Concentric within .008 T.I.R.
Foretaper only, head end large .003 total
Tolerance #1 unless specified

ORDER

SOLID

STYLE SHANK 'D' DIM COATING
MSSB 08 - 60 D=6.85 TOL2 Optima
OVERALL LENGTH TOLERANCE

EJECTOR

STYLE SHANK SIDE HOLE LOCATION TOLERANCE
MESB 10 - 60 19 D=8.9 TOL2 Optima
OVERALL LENGTH 'D' DIM COATING

ALTERATION OPTIONS	
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
PL	Precision Overall Length ±.026mm
PT	Precision head thickness ±.013mm

For additional Alteration Options, see page 114.

SOLID

Style Code	Head THK [T]	Shank [D]	Shank Code	Overall Length [L] 32	40	45	50	56	60	63	70	71	80	90	100	Range D	Head Dia. [H]
MSSB	5	4	04													3-4	7
		5	05													4-5	8
		6	06													5-6	9
		8	08													6-8	11
		10	10													8-10	13
		13	13													10-13	16
		16	16													13-16	19
Overall Length [L] Code				**32**	**40**	**45**	**50**	**56**	**60**	**63**	**70**	**71**	**80**	**90**	**100**		

For nominal size punches, see page 54 for available blanks.

EJECTOR

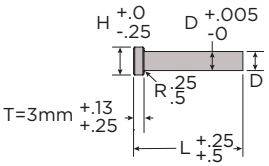
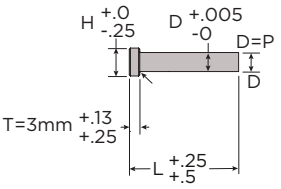
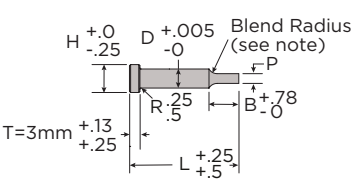
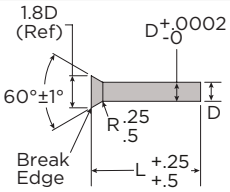
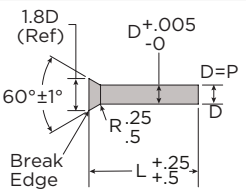
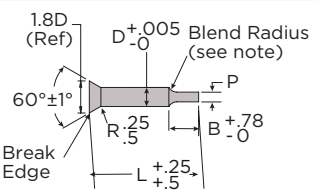
Style Code	Head THK [T]	Shank [D]	Overall Length [L] 32	40	45	50	56	60	63	70	71	80	90	100	Side Hole Location	Range D	Head Dia. [H]	Ejector
MESB	5	6													8	5-6	9	3 (.69)
		06													13			
		8													8	6-8	11	4 (1.04)
		08													13			
															19			
															25			
		10													13	8-10	13	6 (1.47)
		10													19			
															25			
		13													13	10-13	16	6 (1.47)
		13													19			
															25			
		16													13	13-16	19	9 (2.26)
		16													19			
															25			
Overall Length [L] Code			**32**	**40**	**45**	**50**	**56**	**60**	**63**	**70**	**71**	**80**	**90**	**100**				

For nominal size punches, see page 55 for available blanks.

Stock available

CLOSE SPACE PUNCH

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, Ultima® M4

BLANK [BL]	STRAIGHT PUNCH	PUNCH
		
		

OPTIONAL TIP TOLERANCE [P]

TOLERANCE #1
+.013
- 0
Concentric within .013 T.I.R.

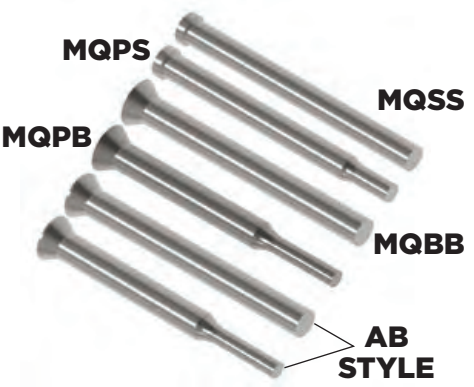
TOLERANCE #2
+.005
- 0
Concentric within .008 T.I.R.

Note: Blend Rad. = 6.35 if not specified

Tolerance #1 unless specified

ROUND & BLANK

Style Code 60° HEAD	Style Code STD HEAD	Shank Dia. [D]	Overall Length [L] 40	45	50	56	60	63	70	71	80	90	100	Head Dia. [H] 60°	STD	Point Length [B]
MQBB Blanks MQPB Rounds	MQBS Blanks MQPS Rounds	2 02												1.8D	4	5
		3 03													5	7
		4 04													6	8
		5 05													7	8
		6 06													8	8
		7 07													9	8
Overall Length [L] Code			40	45	50	56	60	63	70	71	80	90	100			



ORDER BLANK

STYLE SHANK
MQBB 05 - 63
OVERALL LENGTH

ORDER ROUND

STYLE SHANK 'P' DIM
MQPB 06 - 63 P=5.25
OVERALL LENGTH

STRAIGHT

Style Code 60° HEAD	Style Code STD HEAD	Shank Dia. [D]	Overall Length [L] 40	45	50	56	60	63	70	71	80	90	100	Head Dia. [H] 60°	STD	Min. D	Max. D
MQSB	MQSS	2 02												1.8D	4	.8	2
		3 03													5	2	3
		4 04													6	2	4
		5 05													7	3	5
		6 06													8	4	6
		7 07													9	6	7
Overall Length [L] Code			40	45	50	56	60	63	70	71	80	90	100				

ORDER STRAIGHT

STYLE SHANK 'D' DIM
MQSS 04 - 60 D=3.54
OVERALL LENGTH

Stock available

- 60° Head available larger than 6.35 body diameter
- If "D" is greater than 6.35, T=3.962

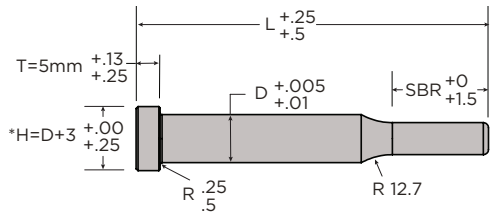
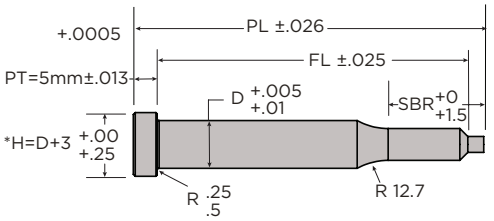
ALTERATION OPTIONS

AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
AT	Altered head thickness
PL	Precision Overall Length ±.026mm
PT	Precision head thickness ±.013mm

For additional Alteration Options, see page 114.

ROUND FORM PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V ULTIMA® M4

ROUND FORM WITHOUT 'FL' (FORM LENGTH)	ROUND FORM WITH 'FL' (FORM LENGTH) ALL ROUND FORM WITH 'FL' ARE PT AND PL
	
*H=Head Diameter	*H=Head Diameter

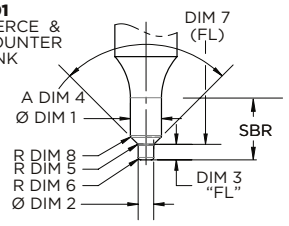
OPTIONAL TIP TOLERANCE [P]

TOLERANCE #1
+.013
- 0
Concentric within .013 T.I.R.

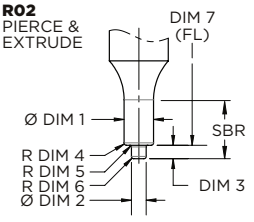
TOLERANCE #2
+.005
- 0
Concentric within .008 T.I.R.

OPTIONAL LENGTH & HEAD THICKNESS TOLERANCE
PL ±.026
PT ±.013

R01 PIERCE & COUNTER SINK

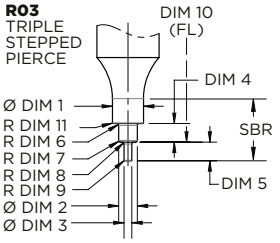


R02 PIERCE & EXTRUDE

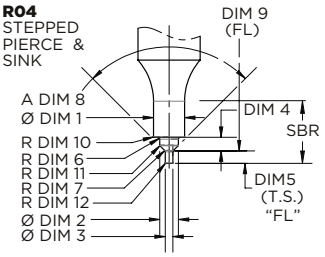


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

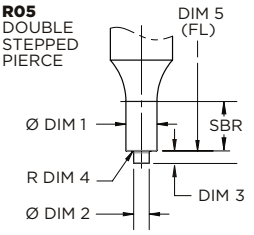
R03 TRIPLE STEPPED PIERCE



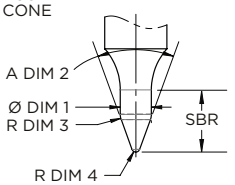
R04 STEPPED PIERCE & SINK



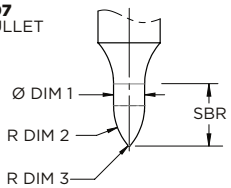
R05 DOUBLE STEPPED PIERCE



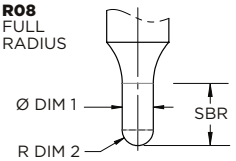
R06 CONE



R07 BULLET

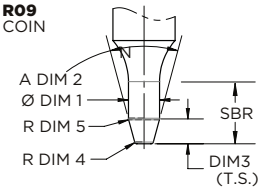


R08 FULL RADIUS

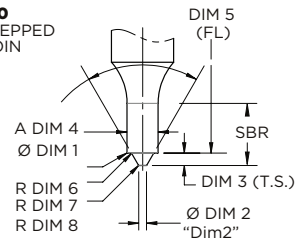


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

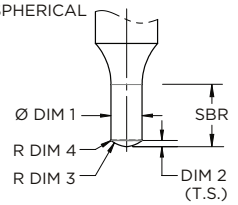
R09 COIN



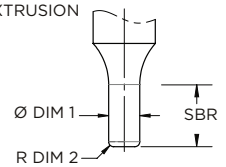
R10 STEPPED COIN



R11 SPHERICAL

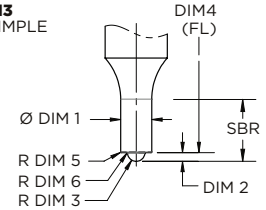


R12 EXTRUSION

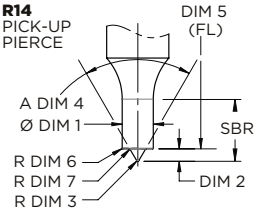


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

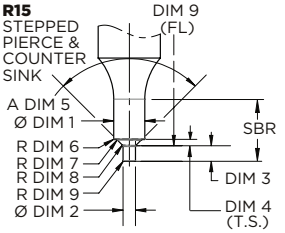
R13 DIMPLE



R14 PICK-UP PIERCE



R15 STEPPED PIERCE & COUNTER SINK



ORDER

Take standard catalog part number + round form part number.

EXAMPLE:
MSPB16-9025 RO5
DIM. 1
DIM. 2
DIM. 3
DIM. 4
DIM. 5

All internal corners will have an internal radius of .26 minimum.

"FL"
Dimension is length from under head to form ±.026 (Form Length).

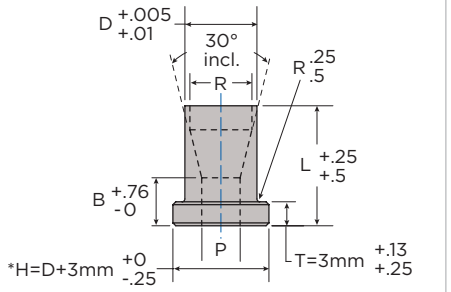
"L"
Dimension tolerance is
+.25
+.5
unless precision "L"

HEADED

CLOSE SPACE GUIDES

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS M4, 10V, 3V,

HEAD DOWN



*H=Head Diameter

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#2 ROUNDS +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

ORDER

STYLE SHANK 'P' DIM
MCSG 08 - 25 P=2.8
OVERALL LENGTH

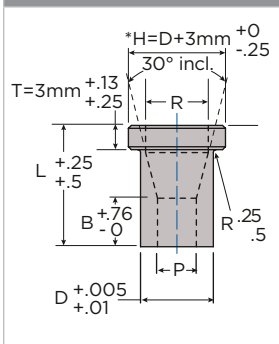
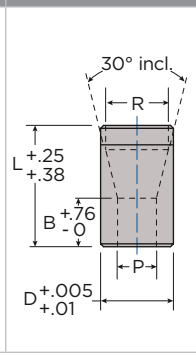
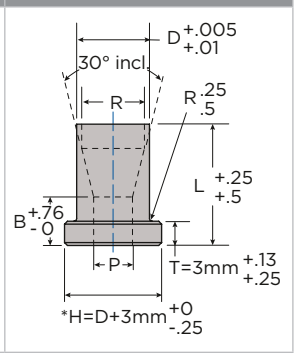
CLOSE SPACE GUIDES

Style Code	Head THK [T]	Shank Dia. [D]	Overall Length [L] 20	25	32	Min. P	Max. P	Head Dia. [H]	Relief [R]
MCSG	3	5 05				1.7	2.5	8	3.6
		6 06				1.7	3	9	4.6
		8 08				1.7	4	11	6.6
		10 10				1.7	5	13	8.2
		13 13				1.7	6	16	11.4
	Overall Length [L] Code		**20**	**25**	**32**				

DIE LAND EXAMPLE
(P = 2) **2 + 1.7 = 3.7**

Land Length [L]	
P	B
.8 – 1.7	2P
1.7 – 2.4	P + 1.7
2.4 – 10.8	.82P + 2.1

GUIDE BUSHINGS

STANDARD MATERIAL M2 60-63 HRC ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4		
HEAD UP	HEADLESS	HEAD DOWN
		

*H=Head Diameter

OPTIONAL HOLE TOLERANCE [P]
#1 ROUNDS +.013 - 0 Hole to Body Concentric within .013 T.I.R.
#1 SHAPES ±.013 Hole to Body Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Hole to Body Concentric within .008 T.I.R.
Tolerance #1 unless specified

ORDER SHAPE

STYLE | SHANK | SHAPE | 'W' DIM | KEY ANGLE

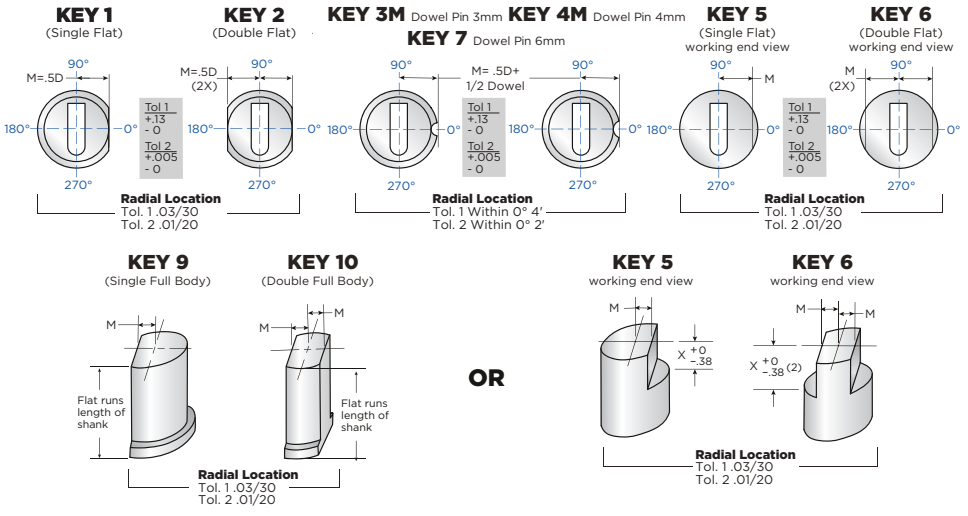
MHDG 10 - 13 OB P=6.0 W=4.25 K1 Y=0

OVERALL LENGTH | 'P' DIM | KEY TYPE

ALTERATION OPTIONS	
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
ARD	Relief diameter larger than standard size
AT	Altered head thickness
PL	Precision Overall Length ±.026mm
PT	Precision head thickness ±.013mm

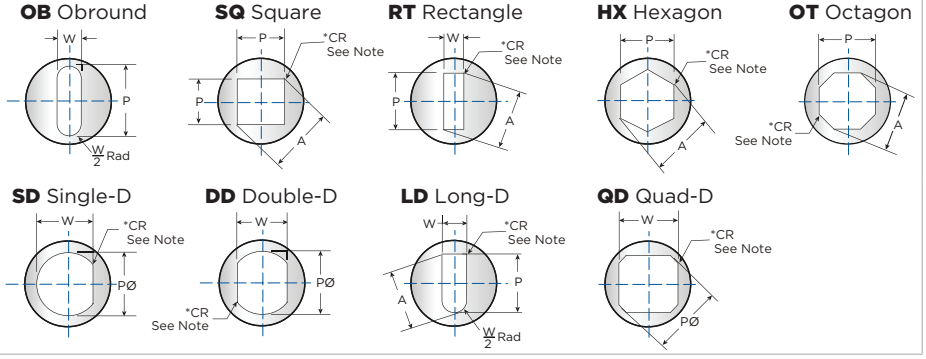
For additional Alteration Options, see page 114.

KEYS



NOTES
• **Key 1-4 & 7** included in all standard shapes price. • Standard 'M' dim. for **Key 5, 6, 9 & 10** see page 119. • Standard M and alterations to keying, see page 119 • Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES
Order Die View. *.178 radius corners typical on shapes. For special shapes see page 107.

GUIDE BUSHINGS

HEAD-UP

Style Code	Head THK [T]	Shank Dia. [D]	Head [H]	Overall Length [L] 8	10	13	16	Min. P	Max. P	Min. P/A	Max. P/G	Relief Dia. [R]
MHUG	3	5 05	8					1.6	3.2	1.3	3.2	3.6
		6 06	9					1.6	3.9	1.3	3.9	4.6
		8 08	11					2.4	5.4	1.3	5.4	6.6
		10 10	13					3.2	6.8	1.3	6.8	8.2
		13 13	16					5.4	8.8	1.9	8.8	11.4
		16 16	19					7.4	10.8	1.9	10.8	Taper only
Overall Length [L] Code				**8**	**10**	**13**	**16**					

HEADLESS

Style Code	Shank Dia. [D]	Overall Length [L] 8	10	13	16	Min. P	Max. P	Min. P/A	Max. P/G	Relief Dia. [R]
MHLG	5 05					1.6	3.2	1.3	3.2	3.6
	6 06					1.6	3.9	1.3	3.9	4.6
	8 08					2.4	5.4	1.3	5.4	6.6
	10 10					3.2	6.8	1.3	6.8	8.2
	13 13					5.4	8.8	1.9	8.8	11.4
	16 16					7.4	10.8	1.9	10.8	Taper only
Overall Length [L] Code		**8**	**10**	**13**	**16**					

HEAD-DOWN

Style Code	Head THK [T]	Shank Dia. [D]	Head [H]	Overall Length [L] 8	10	13	16	Min. P	Max. P	Min. P/A	Max. P/G	Relief Dia. [R]
MHDG	3	5 05	8					1.6	3.2	1.3	3.2	3.6
		6 06	9					1.6	3.9	1.3	3.9	4.6
		8 08	11					2.4	5.4	1.3	5.4	6.6
		10 10	13					3.2	6.8	1.3	6.8	8.2
		13 13	16					5.4	8.8	1.9	8.8	11.4
		16 16	19					7.4	10.8	1.9	10.8	Taper only
Overall Length [L] Code				**8**	**10**	**13**	**16**					

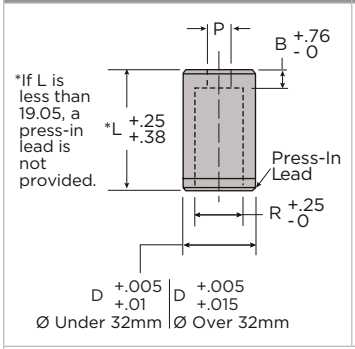
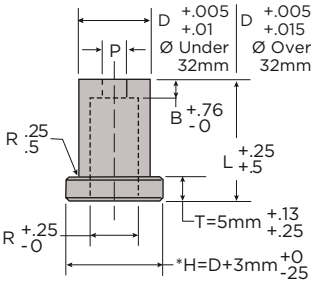
Stock available

DIE LAND EXAMPLE
(P = 2) **2 + 1.7 = 3.7**

Land Length [L]	
P	B
.8 – 1.7	2P
1.7 – 2.4	P + 1.7
2.4 – 10.8	.82P + 2.1

COUNTERBORE RELIEF DIE

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS M4, 10V, 3V, ULTIMA® M4

HEADLESS	HEADED
	

BLANKS: Available with 1.0mm die start hole or no start hole. Start hole concentric to body within .13mm and contains a counterbore.

*H=Head Diameter

OPTIONAL HOLE TOLERANCE [P]
#1 ROUNDS +.013 - 0 Hole to Body Concentric within .013 T.I.R.
#1 SHAPES ±.013 Hole to Body Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Hole to Body Concentric within .008 T.I.R.
Tolerance #1 unless specified

ORDER ROUND

STYLE | SHANK | SHAPE | 'P' DIM | SLUG HUGGER | TOTAL CLEARANCE

MDDC 20 - 25 RD P=7.5 SH2 CLR=.050

OVERALL LENGTH

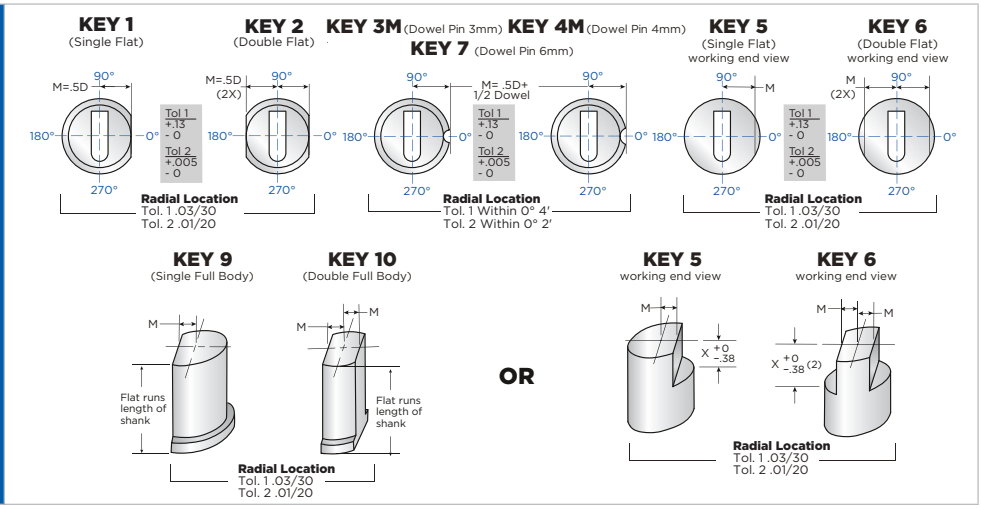
MAT=Mild Steel MT= 3mm

MATERIAL TYPE | MATERIAL THICKNESS

ALTERATION OPTIONS	
ADL	Altered die land (smaller)
PL	Precision Overall Length ±.026
SH2	Slug Hugger®2

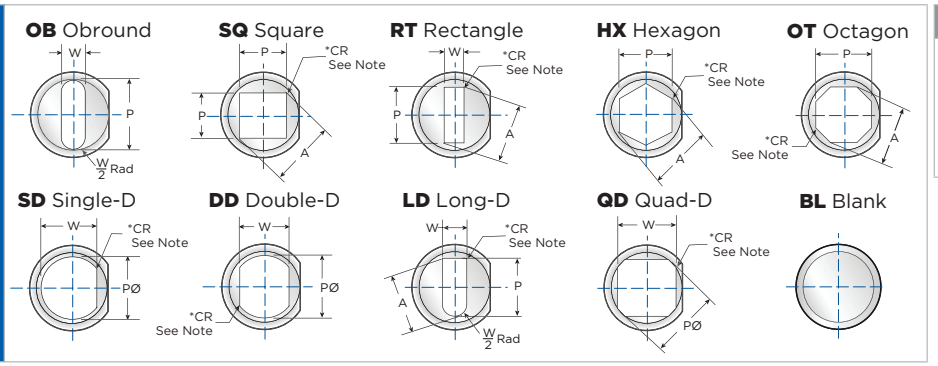
For additional Alteration Options, see page 114.

KEYS



NOTES
• **Key 1-4 & 7** included in all standard shapes price.
• Standard 'M' dimension for **Key 5, 6, 9 & 10** see page 119.
• Standard M and alterations to keying, see page 119.
• Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES
Order Die View.
*.178 radius corners typical on shapes.
For special shapes see page 107.

HEADLESS

Style Code	Shank Dia. [D]	Overall Length [L] 20	22	25	28	30	32	35	Min. P/W	Max. P	Relief Dia. [R]	Die Land [B]
MDDC	6 06								1.25	2.25	3	4
										3.25	4	
	8 08								1.25	2.25	3	4
										2.25	4	
	10 10								1.25	2.25	3	4
									1.5	3.25	4	
									1.5	5.25	6	5
	13 13								1.5	5.25	6	5
										7.25	8	
	16 16								2.25	7.25	8	5
										8.75	9.5	
	20 20								3	8.75	9.5	5
										11.25	12	6.5
	22 22								3.25	11.25	12	6.5
										14.25	15	
	25 25								4	14.25	15	6.5
										16.75	17.5	
	32 32								4.75	16.75	17.5	6.5
										20.25	21	8
	40 40								6.25	20.25	21	8
									6.75	23.25	24	
									6.25	26.25	27	
	45 45								6.25	35.75	36.5	9
	50 50								6.25	40.75	41.5	9
	56 56								8	45.75	46.5	9
	63 63								9.5	50.75	51.5	9
	71 71								11	55.75	56.5	9
Overall Length [L] Code		**20**	**22**	**25**	**28**	**30**	**32**	**35**				

HEADED

Style Code	Head THK [T]	Shank Dia. [D]	Head [H]	Overall Length [L] 20	22	25	28	30	32	35	Min. P/W	Max. P	Relief Dia. [R]	Die Land [B]
MHDC	5	6 06	9								1.25	2.25	3	4
												3.25	4	
		8 08	11								1.25	2.25	3	4
													4	
		10 10	13								1.25	2.25	3	4
											1.5	3.25	4	
											1.5	5.25	6	5
		13 13	16								1.5	5.25	6	5
												7.25	8	
		16 16	19								2.25	7.25	8	5
												8.75	9.5	
		20 20	23								3	8.75	9.5	5
												11.25	12	6.5
		22 22	25								3.25	11.25	12	6.5
												14.25	15	
		25 25	28								4	14.25	15	6.5
												16.75	17.5	
		32 32	35								4.75	16.75	17.5	6.5
												20.25	21	8
		40 40	43								6.25	20.25	21	8
											6.75	23.25	24	
											6.25	26.25	27	
Overall Length [L] Code				**20**	**22**	**25**	**28**	**30**	**32**	**35**				

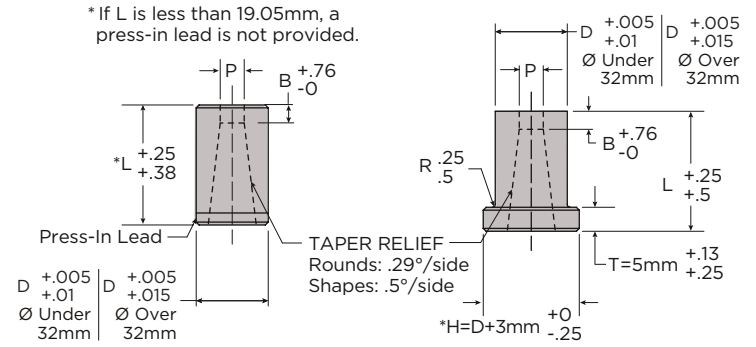
Stock available

HEADED

TAPER RELIEF DIE

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS M4, 10V, 3V, ULTIMA® M4

HEADLESS	HEADED



BLANKS: Available with start hole or no start hole. Start hole concentric to body within .13mm. **Standard Die Land (B) 3mm:** Optional Die Land available.

*H=Head Diameter

OPTIONAL HOLE TOLERANCE [P]
#1 ROUNDS +.013 - 0 Hole to Body Concentric within .013 T.I.R.
#1 SHAPES ±.013 Hole to Body Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Hole to Body Concentric within .008 T.I.R.
Tolerance #1 unless specified

ALTERATION OPTIONS	
AD	Reduce body diameter
ADL	Altered die line
AH	Altered head diameter
AHR	Altered radius under head
AL	Overall length shorter [Shorten shank maintain point]
ART	Relief taper other than standard
AT	Altered head thickness
PL	Precision Overall Length ±.026mm
PT	Precision head thickness ±.013mm
SH2	Slug Hugger® 2
SH4L	Slug Hugger® 4L

For additional Alteration Options, see page 114.

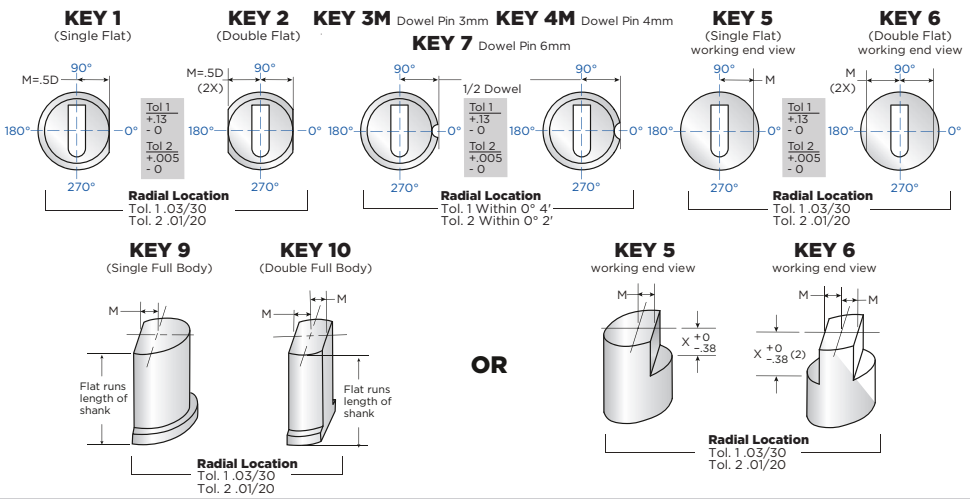
ORDER ROUND

STYLE	SHANK		SHAPE	'P' DIM	HUGGER	CLEARANCE
MHDT	20	- 25	RD	P=7.5	SH2	CLR=0.25

OVERALL LENGTH

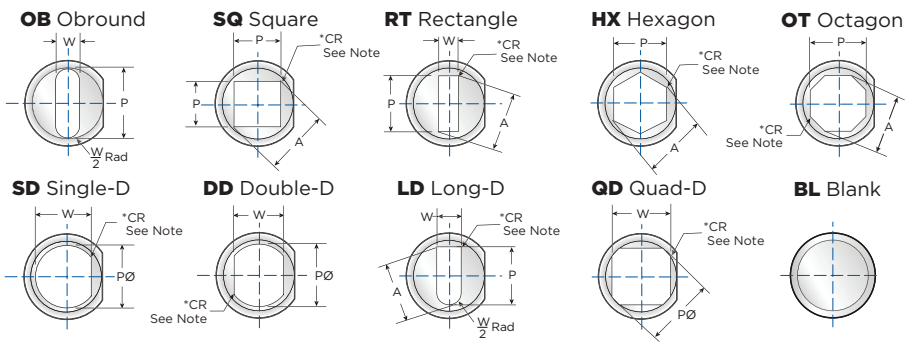
MAT=Mild Steel (MATERIAL TYPE) MT= 3mm (MATERIAL THICKNESS)

KEYS



NOTES
• **Key 1-4 & 7** included in all standard shapes price.
• Standard 'M' dimension for **Key 5, 6, 9 & 10** see page 119.
• Standard M and alterations to keying, see page 119.
• Standard key angle at 0°.

SHAPES — DIE VIEW



NOTES
Order Die View.
*.178 radius corners typical on shapes.
For special shapes see page 107.

TAPER RELIEF DIE

HEADLESS

Style Code	Shank Dia. [D]	Overall Length [L] 13	16	20	22	25	28	30	32	35	Min. P	Min. W	Max. P/A	Die Land [B]
MDDT	5 05										1	1.3	3.2	3
	6 06										1.2	1.3	3.9	
	8 08										1.6	1.3	5.4	
	10 10										2	1.3	6.8	
	13 13										2.6	1.9	8.8	
	16 16										3.2	1.9	10.8	
	20 20										4	1.9	13.6	
	25 25										5	1.9	17	
	32 32										6.4	1.9	22	
	38 38										7.6	1.9	27	
	40 40										8	1.9	27	
	45 45										9	3.3	35	
	50 50										10	3.3	40	
	56 56										11.2	3.3	45	
	63 63										12.6	3.3	50	
	71 71										14.2	3.3	56	
Overall Length [L] Code		**13**	**16**	**20**	**22**	**25**	**28**	**30**	**32**	**35**				

HEADED

Style Code	Head THK [T]	Shank Dia. [D]	Head [H]	Overall Length [L] 13	16	20	22	25	28	30	32	35	Min. P	Min. W	Max. P/A	Die Land [B]
MHDT	5	5 05	8										1	1.3	3.2	3
		6 06	9										1.2	1.3	3.9	
		8 08	11										1.6	1.3	5.4	
		10 10	13										2	1.3	6.8	
		13 13	16										2.6	1.9	8.8	
		16 16	19										3.2	1.9	10.8	
		20 20	23										4	1.9	13.6	
		25 25	28										5	1.9	17	
		32 32	35										6.4	1.9	22	
		38 38	41										7.6	1.9	27	
		40 40	43										8	1.9	27	
		45 45	48										9	3.3	35	
		50 50	53										10	3.3	40	
		56 56	59										11.2	3.3	45	
		63 63	66										12.6	3.3	50	
		71 71	74										14.2	3.3	56	
Overall Length [L] Code				**13**	**16**	**20**	**22**	**25**	**28**	**30**	**32**	**35**				

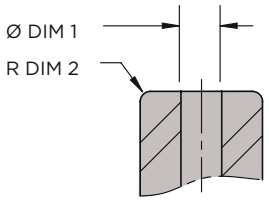
Stock available

Smaller "Min. P/Ws" are available upon request.

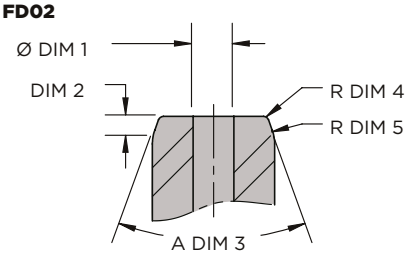
ROUND FORM DIE

STANDARD MATERIAL M2 60-63 HRC — ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4

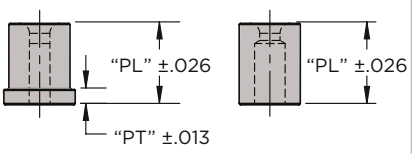
FD01



FD02

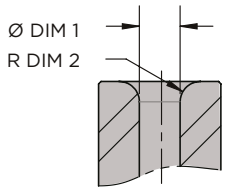


ALSO AVAILABLE WITH TAPER OR COUNTERBORE RELIEF



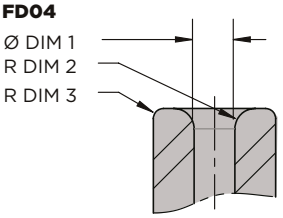
Offer 8Ra, 6Ra & 4Ra Polish

FD03



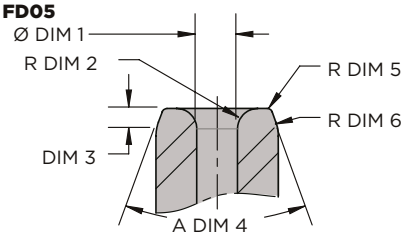
"R DIM 2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD04



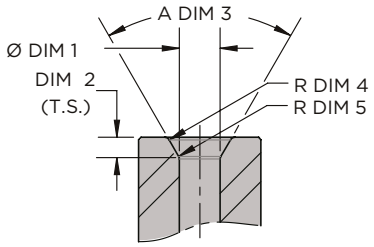
"R DIM 2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD05

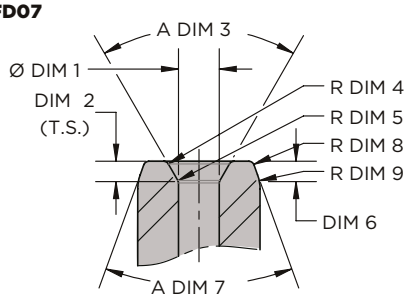


"R DIM 2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

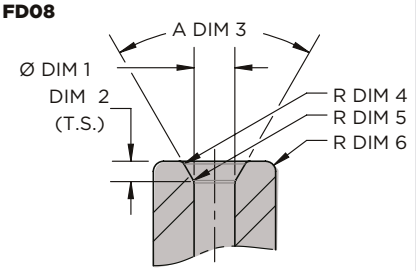
FD06



FD07



FD08



ORDER

Take standard catalog part number plus round tip part number.

EXAMPLE:

MHDT08-28 FD03

DIM. 1

DIM. 2

OPTIONAL HOLE TOLERANCE [P]
TOLERANCE #1 +.013 - 0 Hole to Body Concentric within .013 T.I.R.
TOLERANCE #2 +.005 - 0 Hole to Body Concentric within .008 T.I.R.

ELIMINATE COSTLY SLUG PULLING

Slug pulling can cause expensive press downtime. At the Impax Tooling Solutions® division of Wilson Tool International, our desire to provide innovative tooling solutions for our customers has lead us to develop the Slug Hugger® die design which helps eliminate the very costly problem of slug pulling.

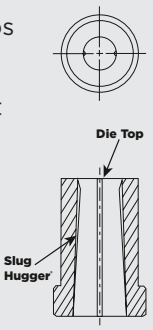
The Slug Pulling Solution

Slug Hugger dies help eliminate scrapped parts, costly downtime, and possible press and tooling damage due to slug pulling.

This unique design helps eliminate unnecessary back-pressure on small punch tips by preventing packed slugs. The Slug Hugger 2 design works on most material types and thicknesses including aluminum and stainless steel while Slug Hugger 4L is specifically designed for thinner materials. They are an available option on all die configurations: taper relief, counterbore relief, headed or headless.

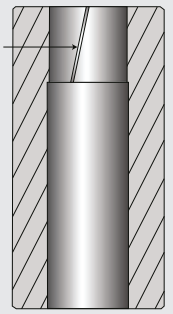
SLUG HUGGER® 2

The Slug Hugger 2 design grabs the slug just below the cutting surface of the die and retains it during the stripping process. Precision "nips" hold slugs in the die and when capacity is reached, one slug per hit is released through the relief.



SLUG HUGGER® 4L

The Slug Hugger 4L retains slugs with the assistance of cavities on the inside of the die. These cavities hold the slug in place after the hit occurs. While the 4L can be used with any material thickness, it is ideal for stamping thinner materials and |is recommended for clearances of less than .004".



Ordering Slug Hugger Dies

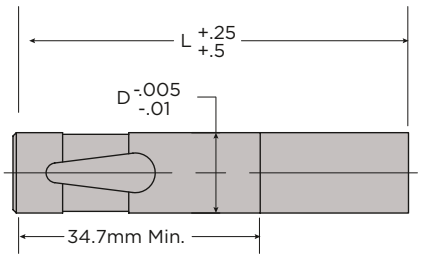
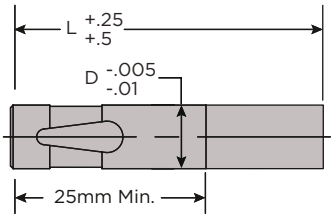
- Use the clearance you want and the die type you like.
- The minimum P/W dimension for the Slug Hugger 4L is 0.050" [1.27mm].
- The minimum total clearance for Slug Hugger 4L shape is 0.001" [.026mm], a round is 0.0005" [.013mm]
- The minimum total P/W dimension for the Slug Hugger 2 is 0.035" [.89mm].
- Minimum clearance for a Slug Hugger 2 shape or round is 0.004" [.10mm] total.

Simply specify that you'd like Slug Hugger 2 or 4L when you place your tooling order. Indicate the type and thickness of material you are stamping as well as your desired clearance. See the example below:

	Quantity	Catalog Number	Shape	P	W	Tolerance	Type	Material Type	Material Thickness	Die Clearance Specify Per Side or Total
INCH	2	**IDDT100-125** Headless Taper Relief Die Round	RD	.5000"	—	1	Slug Hugger® 2	Cold Rolled	.060"	.010" Per Side
INCH	1	**IHDT100-125** Headed Taper Relief Die Shape	OB	.6500"	.4000"	1	Slug Hugger® 4L	Cold Rolled	.020"	.002" Per Side
METRIC	1	**MHDT16-25** Metric Headed Tape Relief Die Shape	SQ	6.5mm	—	1	Slug Hugger® 2	Alum	1.5mm	.105mm Per Side

HEAVY & LIGHT DUTY SOLID BLANKS

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4

HEAVY DUTY	LIGHT DUTY
	

ORDER HEAVY DUTY

STYLE — OVERALL LENGTH

MHSP 10 - 71 BL

SHANK — SHAPE

ORDER LIGHT DUTY

STYLE — OVERALL LENGTH

MLSP 13 - 80 BL

SHANK — SHAPE

HEAVY DUTY SOLID BLANK

Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150
MHSP	10 / 10	④	④							
	13 / 13	④	④	④						
	16 / 16	④	④	④						
	20 / 20	④	④	④						
	25 / 25		④	④						
	32 / 32									
	40 / 40									
Overall Length [L] Code		**63**	**71**	**80**	**90**	**100**	**110**	**125**	**140**	**150**

LIGHT DUTY SOLID BLANK

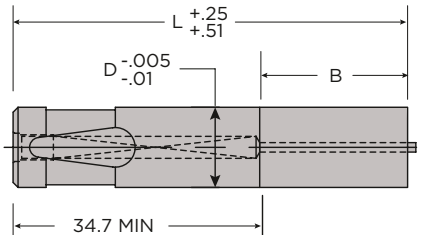
Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150
MLSP	6 / 06	④								
	10 / 10	④	④							
	13 / 13	④	④	④						
	16 / 16	④	④	④						
	20 / 20	④	④	④						
	25 / 25		④	④						
	32 / 32									
	38 / 38									
Overall Length [L] Code		**63**	**71**	**80**	**90**	**100**	**110**	**125**	**140**	**150**

Stock available ④ Ultima® M4 steel available

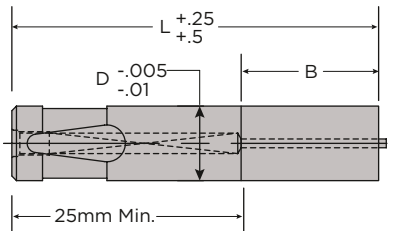
HEAVY & LIGHT DUTY EJECTOR BLANKS

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4

HEAVY DUTY



LIGHT DUTY



EJECTOR COMPONENTS						
Size	.38	.69	1.04	1.47	2.26	3.05
Part #	MEJ2	MEJ3	MEJ4	MEJ6	MEJ9	MEJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

For additional Ejector Components, see page 117.

ORDER

HEAVY DUTY

STYLE SHANK SIDE HOLE LOCATION

MHEB 10 - 90 10 BL

OVERALL LENGTH — SHAPE

LIGHT DUTY

STYLE SHANK SIDE HOLE LOCATION

MLEB 20 - 80 13 BL

OVERALL LENGTH — SHAPE

HEAVY DUTY EJECTOR BLANK

Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150	Side Hole Location [B]	Ejector
MHEP	10 10										10 13 19 25	4 (1.04)
	13 13											6 (1.47)
	16 16											9 (2.26)
	20 20											9 (2.26)
	25 25											9 (2.26)
	32 32											12 (3.05)
	40 40										10, 13, 19, 25, 30	12 (3.05)
Overall Length [L] Code		**63**	**71**	**80**	**90**	**100**	**110**	**125**	**140**	**150**		

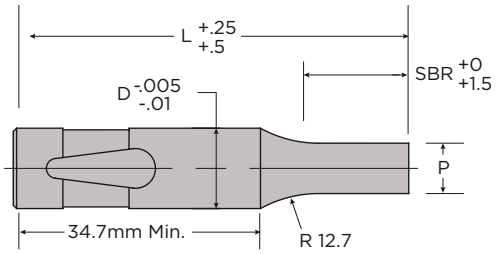
LIGHT DUTY EJECTOR PUNCH

Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150	Side Hole Location [B]	Ejector
MLEP	6 06										10 13 19 25	3 (0.69)
	10 10											4 (1.04)
	13 13											6 (1.47)
	16 16											9 (2.26)
	20 20											9 (2.26)
	25 25											9 (2.26)
	32 32											12 (3.05)
	38 38										10, 13, 19, 25, 30	12 (3.05)
Overall Length [L] Code		**63**	**71**	**80**	**90**	**100**	**110**	**125**	**140**	**150**		

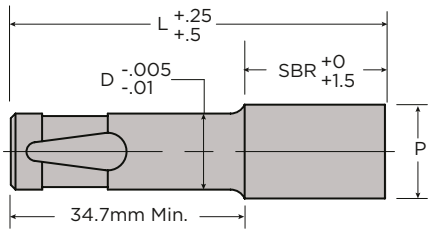
Stock available

HEAVY DUTY SOLID PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4



STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4



Oversized punches can be ordered the same as our regular ball lock part numbers. Use **MHSO** — Metric Heavy Duty Oversized solid punch.

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013 Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

Oversized Punches

ORDER

ROUND

STYLE · SHANK · OVERALL LENGTH · SBR · SHAPE · 'P' DIM · COATING

MHSP 10 - 71 10 RD P=6.35 Optima

SHAPE

STYLE · SHANK · OVERALL LENGTH · SBR · SHAPE · 'P' DIM · 'W' DIM · KEY LOCATION

MHSP 13 - 90 25 OB P=6.35 W=5.0 Y180

OVERSIZED

STYLE · SHANK · OVERALL LENGTH · SBR · SHAPE · 'P' DIM

MHSO 13 - 90 25 RD P=15

ALTERATION OPTIONS	
ABR	Blend radius other than 12.7mm [Round only]
AW	Smaller than standard "W" [Shapes]
PL	Precision Overall Length ±.026mm

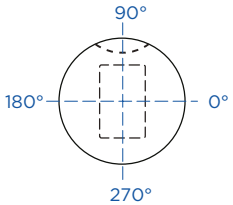
For additional Alteration Options, see page 114.

NOTES

Order Die View.
*.13 radius corners typical on shapes.
For special shapes see page 107.

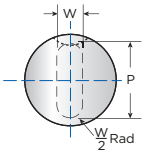
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°

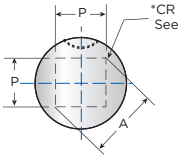


Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

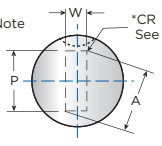
OB Obround



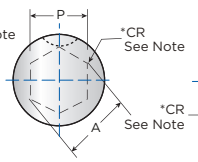
SQ Square



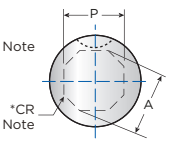
RT Rectangle



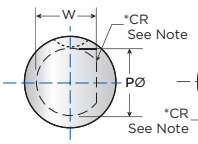
HX Hexagon



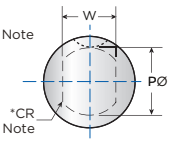
OT Octagon



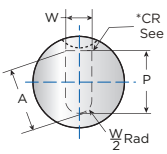
SD Single-D



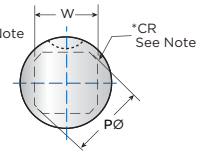
DD Double-D



LD Long-D



QD Quad-D



HEAVY DUTY SOLID PUNCH

HEAVY DUTY SOLID PUNCH

Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150	SBR	Absolute Min. P/W	Min. P/W	Max. P/A
MHSP	10 10	④	④								10	1.4	1.6	9.97
		④	④								19	1.5	2.1	9.97
	13 13	④	④	④							13	4	4.5	12.97
		④	④	④							19			
			④	④							25			
	16 16	④	④	④							13	4	6	15.97
		④	④	④							19			
			④	④							25			
	20 20	④	④	④							13	6	8	19.97
		④	④	④							19			
			④	④							25			
	25 25		④	④							13	8	10	24.97
			④	④							19			
			④	④							25			
	32 32										13	10	12.5	31.97
											19			
											25			
	40 40										19	12	14	39.97
											25			
											30			
Overall Length [L] Code		63	71	80	90	100	110	125	140	150				

OVERSIZED HEAVY DUTY SOLID PUNCH

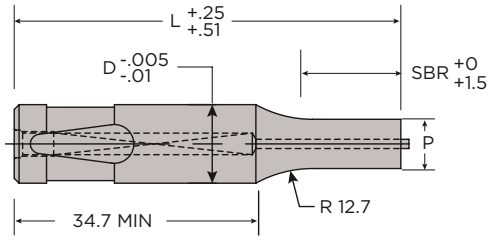
Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	SBR	Min. P/W
MHSO	10 10						10	10
							19	
	13 13						13	13
							19	
							25	
	16 16						13	16
							19	
							25	
	20 20						13	20
							19	
							25	
	25 25						13	25
							19	
							25	
	32 32						13	32
							19	
							25	
	40 40						19	40
							25	
							30	
Overall Length [L] Code		63	71	80	90	100		

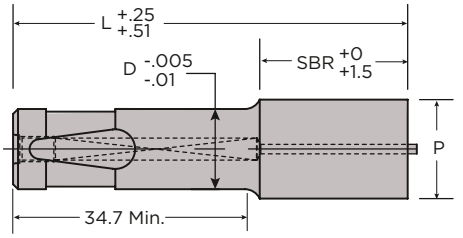
Stock available ④ Ultima® M4 steel available

BALL LOCK

HEAVY DUTY EJECTOR PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4





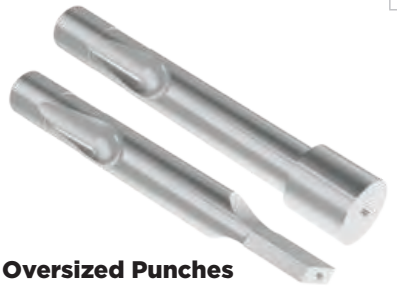
EJECTOR COMPONENTS						
Size	.38	.69	1.04	1.47	2.26	3.05
Part #	MEJ2	MEJ3	MEJ4	MEJ6	MEJ9	MEJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each

Oversized punches can be ordered the same as our regular ball lock part numbers. Use **MEHO** — Metric Heavy Duty Oversized ejector punch.

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013 Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

For additional Ejector Components, see page 117.



Oversized Punches

ORDER

ROUND

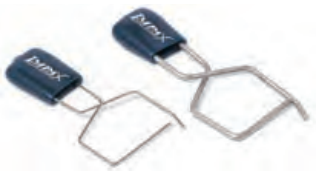
STYLE SHANK SBR 'P' DIM
MHEP 10 - 90 10 RD P=6.35 Optima
OVERALL LENGTH · SHAPE · COATING

SHAPE

STYLE SHANK SBR 'P' DIM KEY LOCATION
MHEP 13 - 110 19 RT P=6.35 W=5.0 Y45
OVERALL LENGTH · SHAPE · 'W' DIM

OVERSIZED

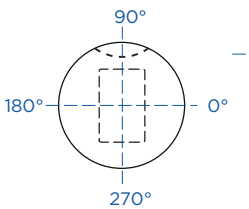
STYLE SHANK SBR 'P' DIM
MHEO 13 - 90 19 SQ P=15
OVERALL LENGTH · SHAPE



EASY SHARP TOOL		
SIZE	**CAT. NO.**	**FITS PIN NO.**
1.5	971481	4, 6, 9, 12
.78	971482	2, 3
Set	971562	

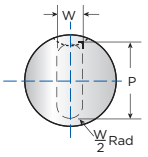
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°

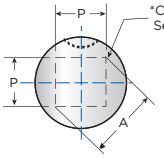


Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

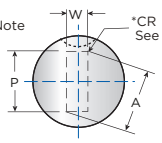
OB Obround



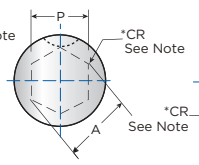
SQ Square



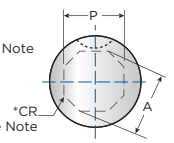
RT Rectangle



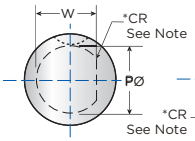
HX Hexagon



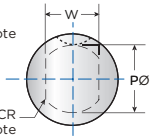
OT Octagon



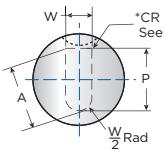
SD Single-D



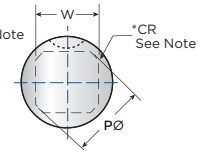
DD Double-D



LD Long-D



QD Quad-D



NOTES

Order Die View.

*.13 radius corners typical on shapes.

For special shapes see page 107.

HEAVY DUTY EJECTOR PUNCH

HEAVY DUTY EJECTOR PUNCH

Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150	SBR	Absolute Min. P/W	Min. P/W	Max. P/A	Ejector
MHEP	10 10										10	1.4	1.6	9.97	4 (1.04)
											19	1.5	2.1		
	13 13										13	4	4.5	12.97	6 (1.47)
											19				
											25				
	16 16										13	4	6	15.97	9 (2.26)
											19				
											25				
	20 20										13	6	8	19.97	9 (2.26)
											19				
											25				
	25 25										13	8	10	24.97	9 (2.26)
											19				
											25				
	32 32										13	10	12.5	31.97	12 (3.05)
											19				
											25				
	40 40										19	12	14	39.97	12 (3.05)
											25				
											30				
Overall Length [L] Code		63	71	80	90	100	110	125	140	150					

OVERSIZED HEAVY DUTY EJECTOR PUNCH

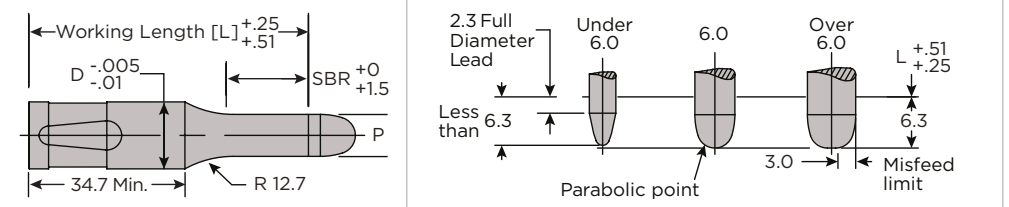
Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	SBR	Min. P/W	Ejector
MHEO	10 10						10	10	4 (1.04)
							19		
	13 13						13	13	6 (1.47)
							19		
							25		
	16 16						13	16	9 (2.26)
							19		
							25		
	20 20						13	20	9 (2.26)
							19		
							25		
	25 25						13	25	9 (2.26)
							19		
							25		
	32 32						13	32	12 (3.05)
							19		
							25		
	40 40						19	40	12 (3.05)
							25		
							30		
Overall Length [L] Code		63	71	80	90	100			

Stock available

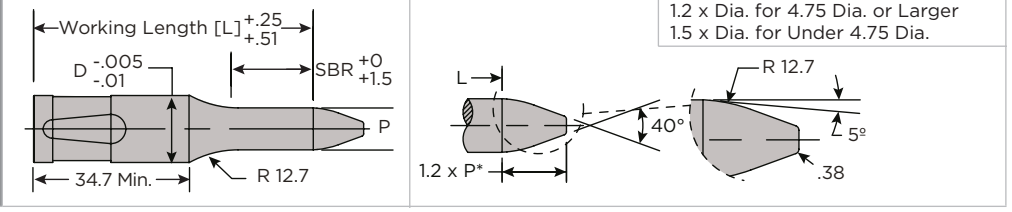
HEAVY DUTY PILOT PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, Ultima® M4

P1 STYLE PARABOLIC PILOT



P2 STYLE ANGULAR PILOT



OPTIONAL TIP TOLERANCE [P]

#1 ROUNDS
+.013
- 0
Point to Shank Concentric within .013 T.I.R.

#2 ROUNDS
+.005
- 0
Point to Shank Concentric within .008 T.I.R.

Note: Shaped pilot punches available.

ORDER

STYLE SHANK SBR 'P' DIM

MHSP 16 - 80 19 RD P=12.7 P1

WORKING LENGTH — SHAPE — PILOT STYLE

P1

P2

BALL LOCK

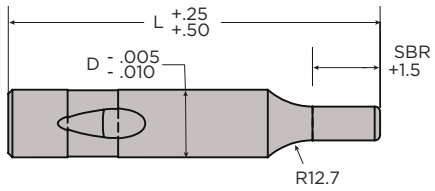
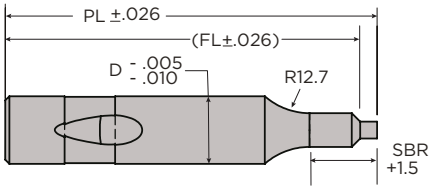
PILOT

Style Code	Shank Dia. [D]	Working Length [L] 63	71	80	90	100	110	125	140	150	SBR	Absolute Min. P/W	Min. P/W	Max. PA
MHSP	10 10	④									10	1.4	1.6	9.97
		④									19	1.5	2.1	
	13 13	④	④								13	4	4.5	12.97
		④	④								19			
			④								25			
	16 16	④	④								13	4	6	15.97
		④	④								19			
			④								25			
	20 20	④	④								13	6	8	19.97
		④	④								19			
			④								25			
	25 25		④								13	8	10	24.97
			④								19			
			④								25			
	32 32										13	10	12.5	31.97
											19			
											25			
	40 40										19	12	14	39.97
											25			
											30			
Working Length [L] Code		63	71	80	90	100	110	125	140	150				

Stock available ④ Ultima® M4 steel available

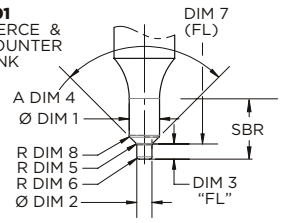
ROUND FORM PUNCH

STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4

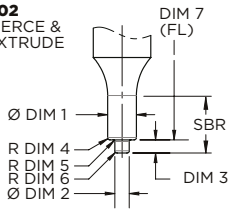
ROUND FORM WITHOUT 'FL' (FORM LENGTH)	ROUND FORM WITH 'FL' (FORM LENGTH) ALL ROUND FORM WITH 'FL' ARE PL
	

OPTIONAL TIP TOLERANCE [P]
TOLERANCE #1 +.013 - 0 Concentric within .013 T.I.R.
TOLERANCE #2 +.005 - 0 Concentric within .008 T.I.R.
OPTIONAL LENGTH TOLERANCE PL ±.026

R01 PIERCE & COUNTER SINK

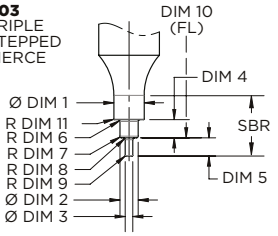


R02 PIERCE & EXTRUDE

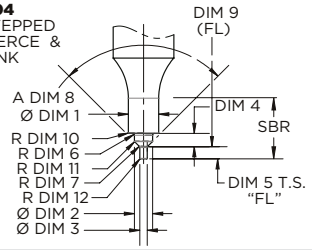


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

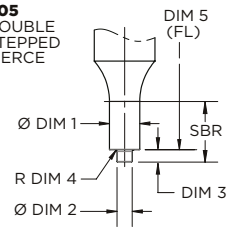
R03 TRIPLE STEPPED PIERCE



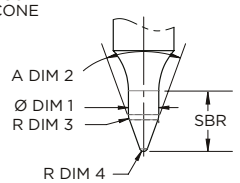
R04 STEPPED PIERCE & SINK



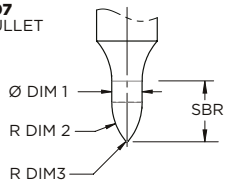
R05 DOUBLE STEPPED PIERCE



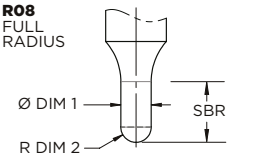
R06 CONE



R07 BULLET

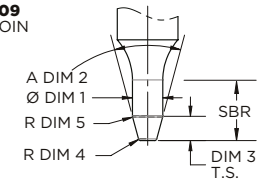


R08 FULL RADIUS

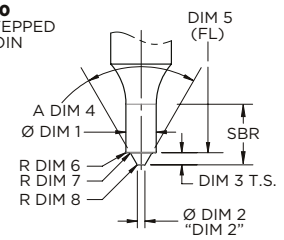


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

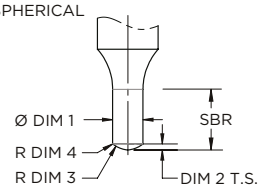
R09 COIN



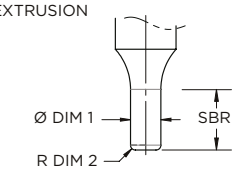
R10 STEPPED COIN



R11 SPHERICAL

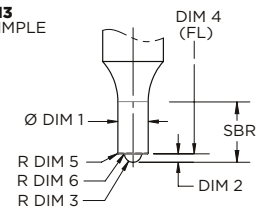


R12 EXTRUSION

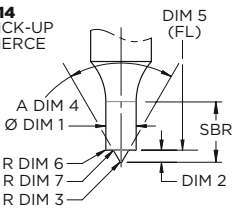


8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

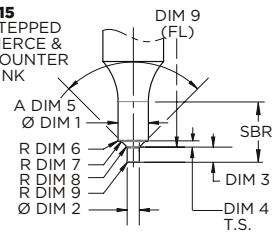
R13 DIMPLE



R14 PICK-UP PIERCE



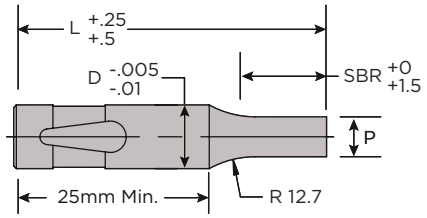
R15 STEPPED PIERCE & COUNTER SINK



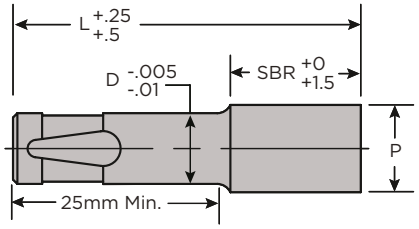
ORDER
Take standard catalog part number + round form part number.
EXAMPLE: MLSP25-10025 R05 DIM. 1 DIM. 2 DIM. 3 DIM. 4 DIM. 5
All internal corners will have an internal radius of .254 minimum.

LIGHT DUTY SOLID PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, Ultima® M4



STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, Ultima® M4



Oversized punches can be ordered the same as our regular ball lock part numbers. Use **MLSO** Metric Light Duty Oversized solid punch.

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013 Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

Oversized Punches

ORDER

ROUND

STYLE SHANK SBR 'P' DIM
MLSP 13 - 80 13 RD P=6.35 Optima
OVERALL LENGTH · SHAPE · COATING

SHAPE

STYLE SHANK SBR 'P' DIM KEY LOCATION
MLSP 32 - 100 25 OB P=20.0 W=14.0 Y0
OVERALL LENGTH · SHAPE · 'W' DIM

OVERSIZED

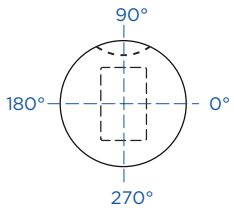
STYLE SHANK SBR 'P' DIM
MLSO 13 - 90 25 SQ P=14
OVERALL LENGTH · SHAPE

ALTERATION OPTIONS	
ABR	Blend radius other than 12.7mm [Round only]
AW	Smaller than standard "W" [Shapes]
PL	Precision Overall Length ±.026mm

For additional Alteration Options, see page 114.

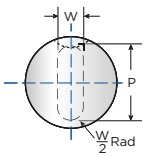
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°

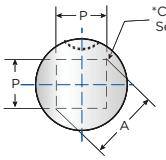


Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

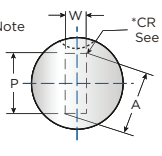
OB Obround



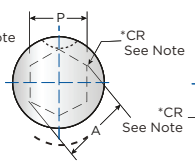
SQ Square



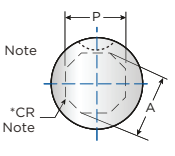
RT Rectangle



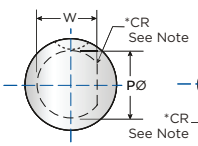
HX Hexagon



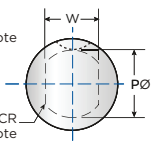
OT Octagon



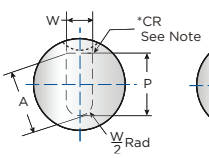
SD Single-D



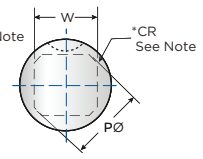
DD Double-D



LD Long-D



QD Quad-D



NOTES

Order Die View.

*.005 radius corners typical on shapes.

For special shapes see page 107.

LIGHT DUTY SOLID PUNCH

LIGHT DUTY SOLID PUNCH	Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150	SBR	Absolute Min. P/W	Min. P/W	Max. P/A
	MLSP	6 06	4									10	1.4	1.6	5.97
			4									13		2.1	
		10 10	4	4								10	1.4	1.6	9.97
			4	4								13	1.5	2.1	
		13 13	4	4	4							13	4	4.5	12.97
			4	4	4							19			
				4	4							25			
		16 16	4	4	4							13	4	6	15.97
			4	4	4							19			
				4	4							25			
		20 20	4	4	4							13	6	8	19.97
			4	4	4							19			
				4	4							25			
		25 25		4	4							13	8	10	24.97
				4	4							19			
				4	4							25			
		32 32										19	10	12.5	31.97
												25			
												30			
		38 38										19	12	14	39.97
												25			
												30			
	Overall Length [L] Code		63	71	80	90	100	110	125	140	150				

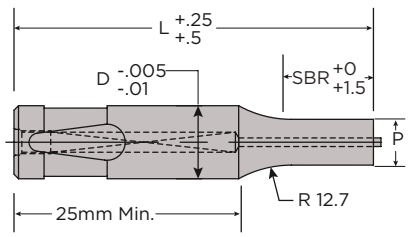
OVERSIZED LIGHT DUTY SOLID PUNCH	Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	SBR	Min. P/W
	MLSO	6 06						10	6
								13	
		10 10						10	10
								13	
		13 13						13	13
								19	
								25	
		16 16						13	16
								19	
								25	
		20 20						13	20
								19	
								25	
		25 25						13	25
								19	
								25	
		32 32						19	32
								25	
								30	
		38 38						19	38
								25	
								30	
	Overall Length [L] Code		63	71	80	90	100		

Stock available 4 Ultima® M4 steel available

BALL LOCK

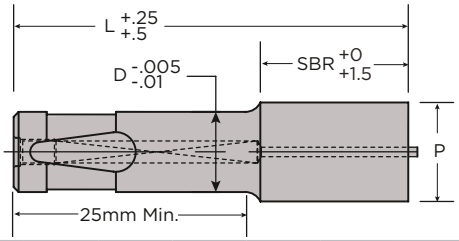
LIGHT DUTY EJECTOR PUNCH

STANDARD MATERIAL M4 62-64 HRC
ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4



EJECTOR COMPONENTS						
Size	.38	.69	1.04	1.47	2.26	3.05
Part #	MEJ2	MEJ3	MEJ4	MEJ6	MEJ9	MEJ12

Replacement component set includes screw, spring and pin. Quantity: 10 each



Oversized punches can be ordered the same as our regular ball lock part numbers. Use **MLEO** Light Heavy Duty Oversized ejector punch.

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#1 SHAPES ±.013 Point to Shank Concentric within .026 T.I.R.
#2 ROUNDS & SHAPES +.005 - 0 Point to Shank Concentric within .008 T.I.R.
Tolerance #1 unless specified

For additional Ejector Components, see p. 117.

Oversized Punches

ORDER

ROUND

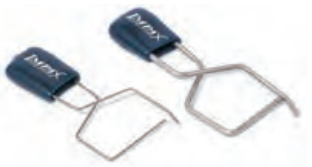
STYLE MLEP | SHANK 20 | OVERALL LENGTH - 80 | SBR 13 | SHAPE RD | 'P' DIM P=12.35 | COATING Optima

SHAPE

STYLE MLEP | SHANK 32 | OVERALL LENGTH - 100 | SBR 25 | SHAPE RT | 'P' DIM P=12.35 | 'W' DIM W=9.0 | KEY LOCATION Y0

OVERSIZED

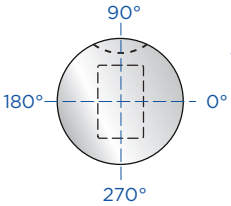
STYLE MLEO | SHANK 13 | OVERALL LENGTH - 90 | SBR 19 | SHAPE SQ | 'P' DIM P=14



EASY SHARP TOOL		
SIZE	**CAT. NO.**	**FITS PIN NO.**
1.5	971481	4, 6, 9, 12
.78	971482	2, 3
Set	971562	

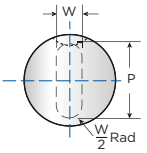
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°

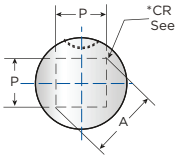


Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

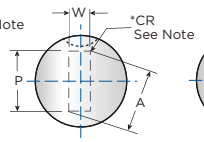
OB Obround



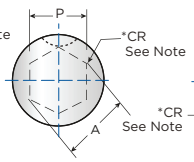
SQ Square



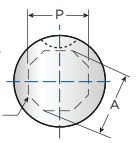
RT Rectangle



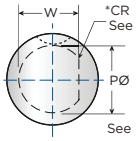
HX Hexagon



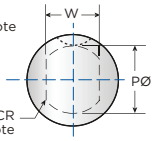
OT Octagon



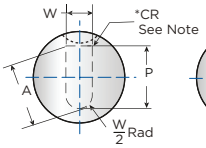
SD Single-D



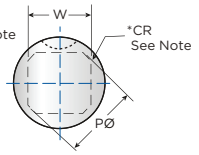
DD Double-D



LD Long-D



QD Quad-D



NOTES

Order Die View.

*.13 radius corners typical on shapes.

For special shapes see page 107.

LIGHT DUTY EJECTOR PUNCH

LIGHT DUTY EJECTOR PUNCH

Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	110	125	140	150	SBR	Absolute Min. P/W	Min. P/W	Max. P/A	Ejector
MLEP	6 06										10	1.4	1.6	5.97	3 (0.69)
											13		2.1		
	10 10										10	1.4	1.6	9.97	4 (1.04)
											13	1.5	2.1		
	13 13										13	4	4.5	12.97	6 (1.47)
											19				
											25				
	16 16										13	4	6	15.97	9 (2.26)
											19				
											25				
	20 20										13	6	8	19.97	9 (2.26)
											19				
											25				
	25 25										13	8	10	24.97	9 (2.26)
											19				
											25				
	32 32										19	10	12.5	31.97	12 (3.05)
											25				
											30				
	38 38										19	12	14	39.97	12 (3.05)
											25				
											30				
Overall Length [L] Code		63	71	80	90	100	110	125	140	150					

OVERSIZED LIGHT DUTY EJECTOR PUNCH

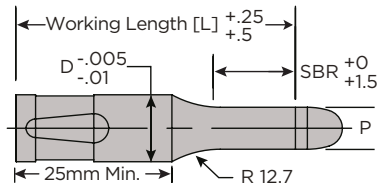
Style Code	Shank Dia. [D]	Overall Length [L] 63	71	80	90	100	SBR	Min. P/W	Ejector
MLEO	6 06						10	6	3 (0.69)
							13		
	10 10						10	10	4 (1.04)
							13		
	13 13						13	13	6 (1.47)
							19		
							25		
	16 16						13	16	9 (2.26)
							19		
							25		
	20 20						13	20	9 (2.26)
							19		
							25		
	25 25						13	25	9 (2.26)
							19		
							25		
	32 32						19	32	12 (3.05)
							25		
							30		
	38 38						19	38	12 (3.05)
							25		
							30		
Overall Length [L] Code		63	71	80	90	100			

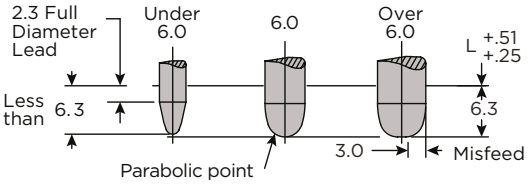
Stock available

LIGHT DUTY PILOT PUNCH

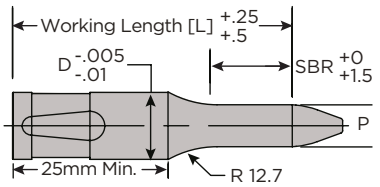
STANDARD MATERIAL M4 62-64 HRC — ALTERNATE MATERIALS 10V, 3V, ULTIMA® M4

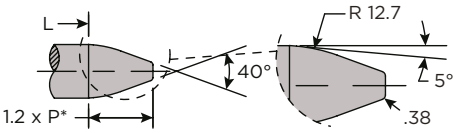
P1 STYLE PARABOLIC PILOT





P2 STYLE ANGULAR PILOT

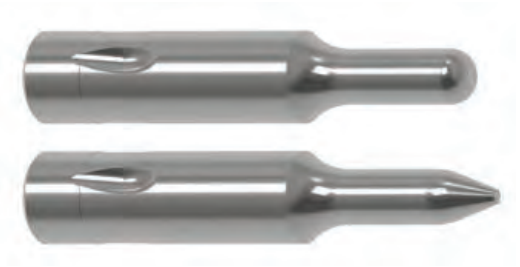




1.2 x Dia. for 4.75 Dia. or Larger
1.5 x Dia. for Under 4.75 Dia.

ORDER

STYLE	SHANK		SBR		'P' DIM	
MLSP	25	- 90	19	RD	P=12.7	P1
		WORKING LENGTH		SHAPE		PILOT STYLE



P1

P2

OPTIONAL TIP TOLERANCE [P]
#1 ROUNDS +.013 - 0 Point to Shank Concentric within .013 T.I.R.
#2 ROUNDS +.005 - 0 Point to Shank Concentric within .008 T.I.R.

Note: Shaped pilot punches available.

LIGHT DUTY PILOT PUNCH

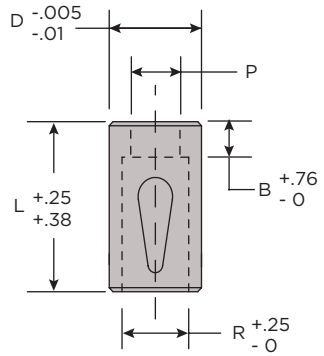
PILOT	Style Code	Shank Dia. [D]	Working Length [L] 63	71	80	90	100	110	125	140	150	SBR	Absolute Min. P/W	Min. P/W	Max. P/A
	MLSP	6 06	4									10	1.4	1.6	5.97
			4									13		2.1	
		10 10	4	4								10	1.4	1.6	9.97
			4	4								13	1.5	2.1	
		13 13	4	4								13	4	4.5	12.97
			4	4								19			
				4								25			
		16 16	4	4								13	4	6	15.97
			4	4								19			
				4								25			
		20 20	4	4								13	6	8	19.97
			4	4								19			
				4								25			
		25 25		4								13	8	10	24.97
				4								19			
				4								25			
		32 32										13	10	12.5	31.97
												19			
												25			
		38 38										19	12	14	39.97
												25			
												30			
	Working [L] Code		63	71	80	90	100	110	125	140	150				

Stock available 4 Ultima® M4 steel available

BALL LOCK

COUNTERBORE RELIEF DIE

STANDARD MATERIAL M2 60-63 HRC
ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4



Also available with taper relief.

BLANKS: Available with 1.0mm dia. start hole. Start hole concentric to body within .13mm and contains a counterbore.

OPTIONAL HOLE TOLERANCE [P]

#1 ROUNDS
+.013
- 0
Hole to Body Concentric within .013 T.I.R.

#1 SHAPES
±.026
Hole to Body Concentric within .026 T.I.R.

#2 ROUNDS & SHAPES
+.005
- 0
Hole to Body Concentric within .008 T.I.R.

ORDER

ROUND

STYLE SHANK SHAPE 'P' DIM
MLBD 16 - 32 RD P=4.0
OVERALL LENGTH

SHAPE

STYLE SHANK SHAPE 'P' DIM 'W' DIM SLUG HUGGER TOTAL CLEARANCE
MLBD 25 - 32 OB P=4.0 W=3.3 SH2 CLR=.50
OVERALL LENGTH
MAT=Mild Steel MT= 3mm
MATERIAL TYPE MATERIAL THICKNESS

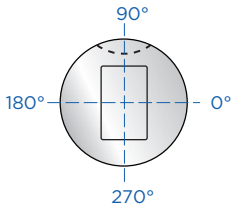
ALTERATION OPTIONS

ADL	Altered head diameter
PL	Precision Overall Length ±.026
SH2	Slug Hugger®2

For additional Alteration Options, see page 114.

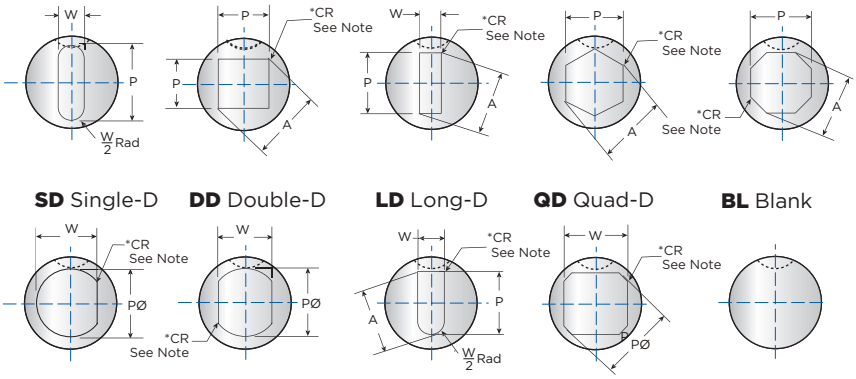
SHAPES — DIE VIEW

STANDARD KEY LOCATION IS 90°



Radial Location
Tol. 1 Within 0° 4′
Tol. 2 Within 0° 2′

OB Obround
SQ Square
RT Rectangle
HX Hexagon
OT Octagon
SD Single-D
DD Double-D
LD Long-D
QD Quad-D
BL Blank



NOTES

Order Die View.

*.178 radius corners typical on shapes.

For special shapes see page 107.

BALL LOCK

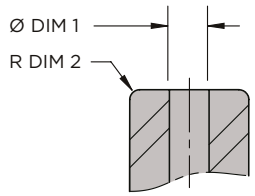
Style Code	Shank Dia. [D]	Length [L]	Absolute Min. P/W	Min. P	Min. W	Max. P/A	Relief Dia. R	Die Land B
MLBD	13 13	32 32	.8	1.5	1.5	5	6	4
	16 16			2.4	2.4	7.2	8	5
	20 20			3	3	11	12	5
	25 25			3.2	3.2	15	16	6
	32 32			4	4	19	20	6
	38 38			5	5	26	27	8

Note: Longer lengths available upon request.

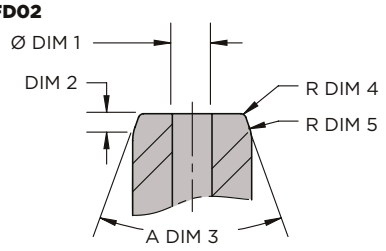
ROUND FORM DIE

STANDARD MATERIAL M2 60-63 HRC — ALTERNATE MATERIALS 10V, M4, 3V, ULTIMA® M4

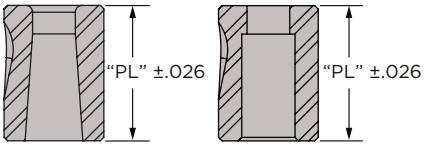
FD01



FD02

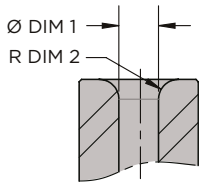


ALSO AVAILABLE WITH TAPER OR COUNTERBORE RELIEF



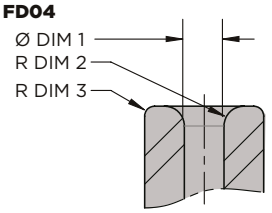
Offer 8Ra, 6Ra & 4Ra Polish

FD03



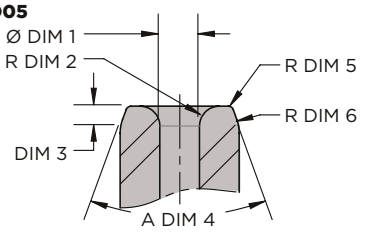
"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD04



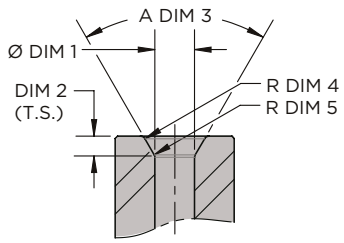
"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

FD05

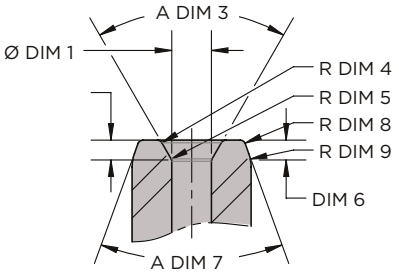


"R DIM2" 8Ra Polish Standard
Also Offer 6Ra & 4Ra Polish

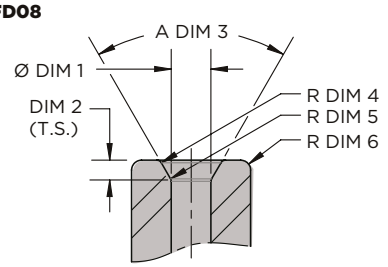
FD06



FD07



FD08



ORDER

Take standard catalog part number plus round tip part number.

EXAMPLE:

MLBD20-32 FD03

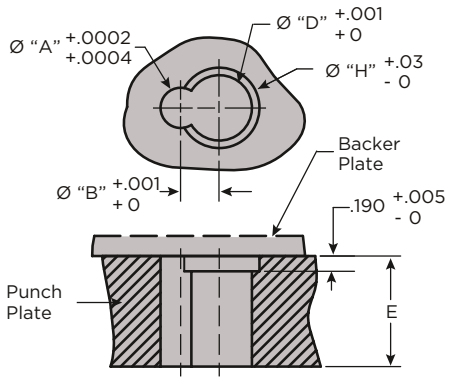
DIM. 1

DIM. 2

OPTIONAL HOLE TOLERANCE [P]
TOLERANCE #1 +.013 - 0 Hole to Body Concentric within .013 T.I.R.
TOLERANCE #2 +.005 - 0 Hole to Body Concentric within .008 T.I.R.

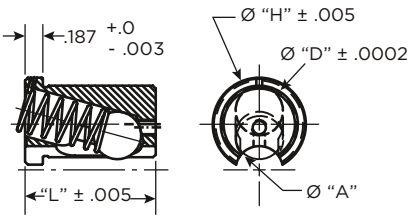
HP ACCU-LOCK® SPECIAL RETAINER INSERTS

PUNCH PLATE HOLE SPECIFICATION



*Tolerance for 1.250 punch/hole is +.0006/+.0003

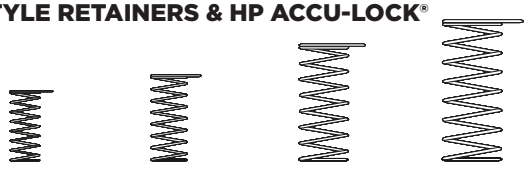
INSERT SPECIFICATION



ORDER

	STYLE	SHANK
HEAVY DUTY	IHIS	050
LIGHT DUTY	ILIS	050

REPLACEMENT SPRINGS FOR BACKING PLATE STYLE RETAINERS & HP ACCU-LOCK®



250 S	312 S	375 S	500 S
1/4 SPRING	5/16 SPRING	3/8 SPRING	1/2 SPRING
971380	971381	971382	971383

HEAVY DUTY

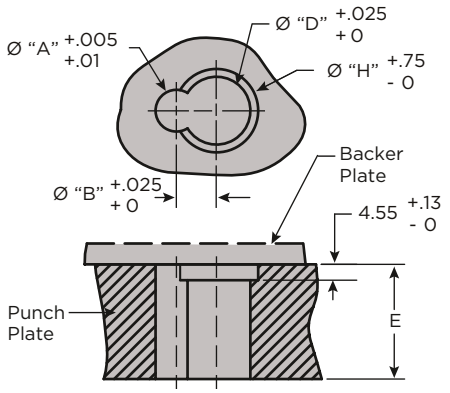
Style Code	Insert Specification					Punch Plate Specification					
	Shank Dia.	Shank Code	Insert Dia. [D]	Insert Head [H]	Length [L]	Punch Dia. Hole [A]	Center to Center [B]	Insert Hole Dia. [D]	Head C-Bore Dia. [H]	Plate Thickness [E]	Inner Booster Spring
IHIS	.375	037	.625	.735	1.38	.375	.375	.6255	.75	1.38	972100
	.5	050	.8125	.98		.5	.48	.813	1		972101
	.625	062	.8125	.98		.625	.543	.813	1		
	.75	075	.8125	.98		.75	.605	.813	1		
	.875	087	.8125	.98		.875	.668	.813	1		
	1.00	100	.8125	.98		1.00	.73	.813	1		
	1.25	125*	.8125	.98		1.25	.855	.813	1		

LIGHT DUTY

Style Code	Insert Specification					Punch Plate Specification					
	Shank Dia.	Shank Code	Insert Dia. [D]	Insert Head [H]	Length [L]	Punch Dia. Hole [A]	Center to Center [B]	Insert Dia. [D]	Head C-Bore Dia [H]	Plate Thickness [E]	Inner Booster Spring
ILIS	.25	025	.5	.615	1	.25	.28	.5005	.625	1.00	972100
	.375	037	.5	.615		.375	.325	.5005	.625		
	.5	050	.5625	.69		.5	.406	.5630	.72		972101
	.625	062	.5625	.69		.625	.469	.5630	.72		
	.75	075	.625	.735		.75	.563	.6255	.75		
	.875	087	.625	.735		.875	.625	.6255	.75		
	1.00	100	.625	.735		1.00	.688	.6255	.75		

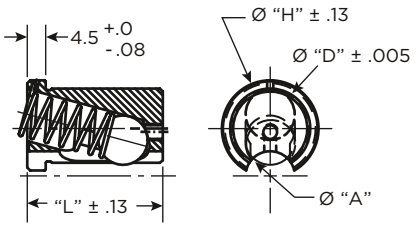
HP ACCU-LOCK® SPECIAL RETAINER INSERTS

PUNCH PLATE HOLE SPECIFICATION



*Tolerance for 40mm punch/hole is +.015/+.012

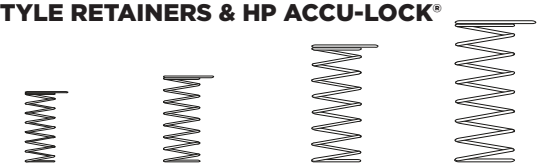
INSERT SPECIFICATION



ORDER

	STYLE	SHANK
HEAVY DUTY	MHIS	020
LIGHT DUTY	MLIS	013

REPLACEMENT SPRINGS FOR BACKING PLATE STYLE RETAINERS & HP ACCU-LOCK®



972070 6mm	972071 8mm	972072 10mm	972073 12mm

HEAVY DUTY

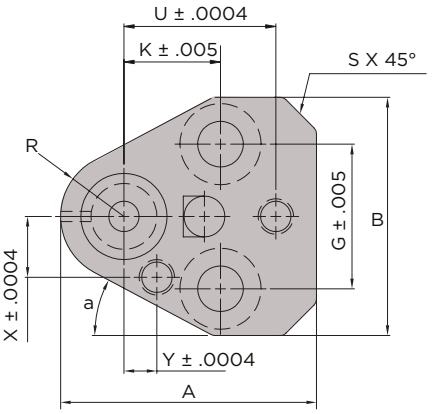
Style Code	Insert Specification					Punch Plate Specification					
	Shank Dia.	Shank Code	Insert Dia. [D]	Insert Head [H]	Length [L]	Punch Dia. Hole [A]	Center to Center [B]	Insert Hole Dia. [D]	Head C-Bore Dia. [H]	Plate Thickness [E]	Inner Booster Spring
MHIS	10	010	16	19.6	34.7	10	10	16.013	20	34.7	972100
	13	013	20	24.6		13	11.5	20.013	25		972101
	16	016	20	24.6		16	13	20.013	25		
	20	020	20	24.6		20	15	20.013	25		
	25	025	20	24.6		25	17.5	20.013	25		
	32	032	20	24.6		32	21	20.013	25		
	40	040*	20	24.6		40	25	20.013	25		

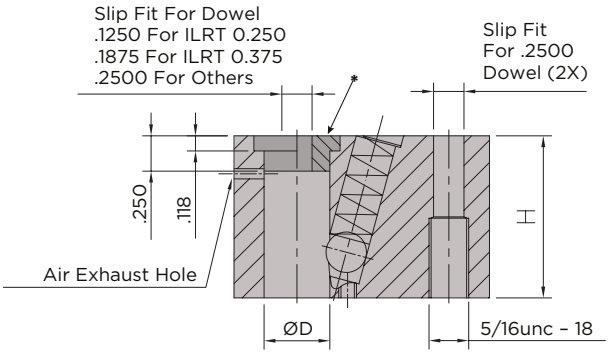
LIGHT DUTY

Style Code	Insert Specification					Punch Plate Specification					
	Shank Dia.	Shank Code	Insert Dia. [D]	Insert Head [H]	Length [L]	Punch Dia. Hole [A]	Center to Center [B]	Insert Hole Dia. [D]	Head C-Bore Dia. [H]	Plate Thickness [E]	Inner Booster Spring
MLIS	6	006	12	14.6	25.7	6	6.5	12.013	15	25.7	972100
	10	010	14	16.6		10	9	14.013	17		972101
	13	013	14	16.6		13	10.5	14.013	17		
	16	016	14	16.6		16	12	14.013	17		
	20	020	16	18.6		20	14	16.013	19		
	25	025	16	18.6		25	16.5	16.013	19		
	32	032	16	18.6		32	20	16.013	19		
	38	038	16	18.6		38	23	16.013	19		

HP TRU ADVANTAGE RETAINER

Furnished with backing plugs instead of backing plate.
See page 103 for backing/plug options.



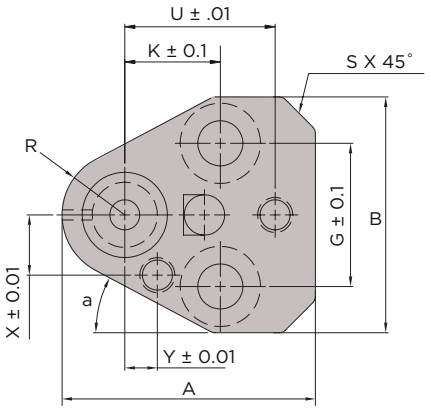


ORDER	STYLE	SHANK
HEAVY DUTY	IHRT	050
LIGHT DUTY	ILRT	087

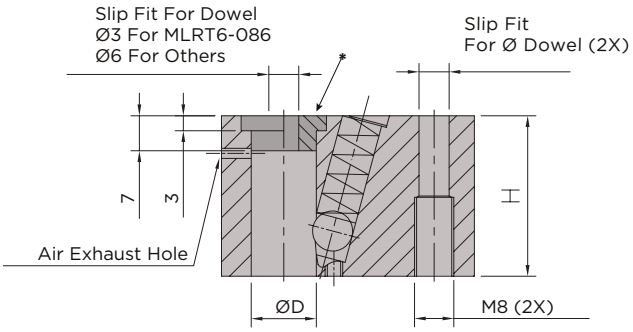
	Style Code	Shank Dia. [D]	Shank Code	A	B	G	H	K	R	S	U	X	Y	a°	Screw Size
HEAVY DUTY	IHRT	.375	037	1.744	1.614	0.876	1.614	0.750	0.37	0.197	1.060	0.354	0.295	30°	5/16-18
		.500	050	1.984	1.850	1.124	1.614	0.750	0.49	0.265	1.180	0.472	0.256	28°	3/8-16
		.625	062	2.106	1.969	1.250	1.614	0.750	0.55	0.335	1.250	0.532	0.236	28°	3/8-16
		.750	075	2.366	2.165	1.376	1.614	0.750	0.69	0.394	1.320	0.650	0.197	28°	3/8-16
		.875	087	2.492	2.291	1.376	1.614	0.750	0.75	0.433	1.400	0.728	0.197	28°	3/8-16
		1.00	100	2.744	2.480	1.562	1.614	0.938	0.87	0.472	1.600	0.866	0.276	28°	1/2-13
		1.25	125	2.744	2.480	1.562	1.614	0.938	0.87	0.472	1.600	0.866	0.276	28°	1/2-13

	Style Code	Shank Dia. [D]	Shank Code	A	B	G	H	K	R	S	U	X	Y	a°	Screw Size
LIGHT DUTY	ILRT	.250	025	1.744	1.614	0.876	1.260	0.750	0.37	0.197	1.060	0.354	0.295	30°	5/16-18
		.375	037	1.744	1.614	0.876	1.260	0.750	0.37	0.197	1.060	0.354	0.295	30°	5/16-18
		.500	050	1.984	1.850	1.124	1.260	0.750	0.49	0.295	1.180	0.472	0.256	28°	3/8-16
		.625	062	2.106	1.969	1.250	1.260	0.750	0.55	0.335	1.250	0.532	0.236	28°	3/8-16
		.75	075	2.366	2.165	1.376	1.260	0.750	0.69	0.394	1.320	0.650	0.197	28°	3/8-16
		.875	087	2.492	2.291	1.376	1.260	0.750	0.75	0.433	1.400	0.728	0.197	28°	3/8-16
		1.00	100	2.744	2.480	1.562	1.260	0.938	0.87	0.472	1.600	0.866	0.276	28°	1/2-13

HP TRU ADVANTAGE RETAINER



Furnished with backing plugs instead of backing plate.
See page 105 for backing/plug options.



ORDER

	STYLE	SHANK
HEAVY DUTY	MHRT	020
LIGHT DUTY	MLRT	013

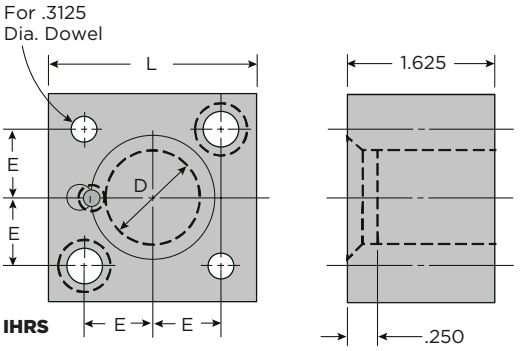
HEAVY DUTY

Style Code	Shank Dia. [D]	Shank Code	A	B	G	H	K	R	S	U	X	Y	a°	Screw Size
MHRT	10	010	44.3	41	22.24	41	19.95	9.5	5	26.925	9	7.5	30°	M8
	13	013	50.4	47	28.54	41	19.05	12.5	7.5	29.97	12	6.5	28°	M8
	16	016	53.5	50	31.74	41	19.05	14	8.5	31.75	13.5	6	28°	M8
	20	020	60.1	55	34.94	41	19.05	17.5	10	33.53	16.5	5	28°	M10
	25	025	69.7	63	39.68	41	23.82	22	12	40.64	22	7	28°	M12
	32	032	69.7	63	39.68	41	23.82	22	12	40.64	22	7	28°	M12
	40	040	76.4	73	48	41	27	26	15	43.993	26	10	28°	M12

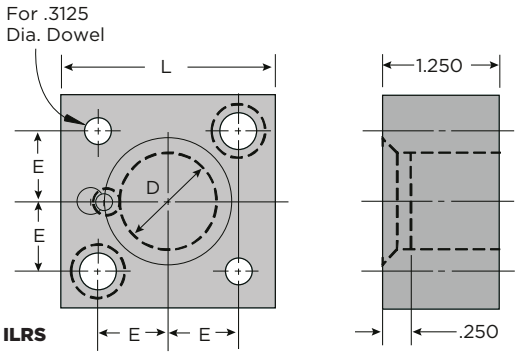
LIGHT DUTY

Style Code	Shank Dia. [D]	Shank Code	A	B	G	H	K	R	S	U	X	Y	a°	Screw Size
MLRT	6	006	35	37.5	22.2	32	19	8	5	23	8	9	30°	M6
	10	010	44.3	41	22.24	32	19.95	9.5	5	26.925	9	7.5	30°	M8
	13	013	50.4	47	28.54	32	19.05	12.5	7.5	29.97	12	6.5	28°	M8
	16	016	53.5	50	31.74	32	19.05	14	8.5	31.75	13.5	6	28°	M8
	20	020	60.1	55	34.94	32	19.05	17.5	10	33.53	16.5	5	28°	M10
	25	025	69.7	63	39.68	32	23.82	22	12	40.64	22	7	28°	M12
	32	032	69.7	63	39.68	32	23.82	22	12	40.64	22	7	28°	M12
	38	038	76.4	73	48	32	27	26	15	43.993	26	10	28°	M12

SQUARE RETAINER



Furnished with backing plugs instead of backing plate.
See page 103 for backing/plug options.



ORDER

	STYLE	SHANK
HEAVY DUTY	IHRS	062
LIGHT DUTY	ILRS	062

HEAVY DUTY

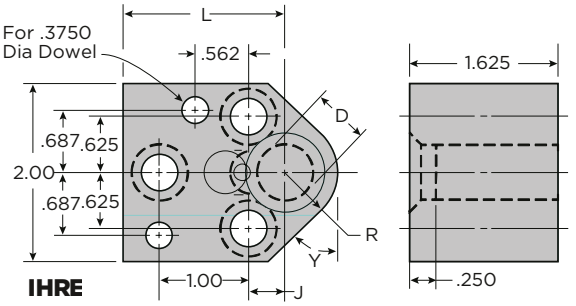
Style Code	Shank Dia.	L	E	Screw Size
IHRS	.500 050	1.88	.562	3/8-16
	.625 062	2	.625	3/8-16
	.750 075	2.12	.688	3/8-16
	.875 087	2.38	.750	1/2-13
	1.00 100	2.38	.750	1/2-13
	1.25 125	2.62	.812	1/2-13

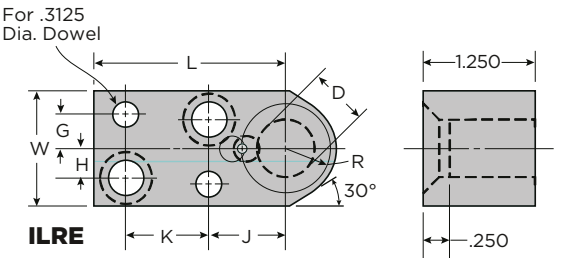
LIGHT DUTY

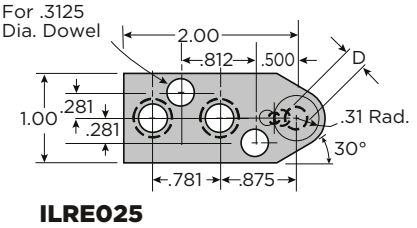
Style Code	Shank Dia.	L	E	Screw Size
ILRS	.250 025	1.25	.312	1/4-20
	.375 037	1.38	.375	5/16-18
	.500 050	1.50	.438	5/16-18
	.625 062	1.62	.500	5/16-18
	.750 075	1.88	.562	3/8-16
	.875 087	2.00	.625	3/8-16
	1.00 100	2.25	.750	3/8-16
	1.25 125	2.25	.750	3/8-16
	1.50 150	2.75	1.00	3/8-16
	1.75 175	2.75	1.00	3/8-16

END RETAINER

Furnished with backing plugs instead of backing plate.
See page 103 for backing/plug options.





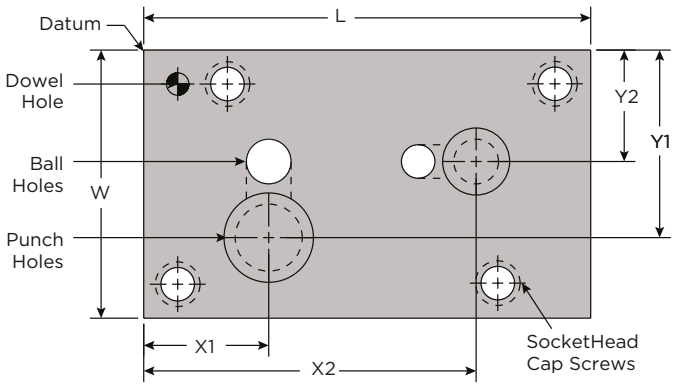


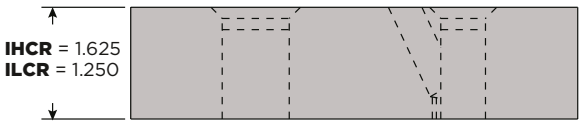
ORDER	STYLE	SHANK
HEAVY DUTY	IHRE	050
LIGHT DUTY	ILRE	062

	Style Code	Shank Dia.	L	J	R	Y	Screw Size
HEAVY DUTY	IHRE	.500 050	1.75	.375	.50	40°	3/8-16
		.625 062	1.81	.438	.56	45°	3/8-16
		.750 075	1.88	.500	.69	60°	3/8-16
		.875 087	1.94	.562	.75	60°	3/8-16
		1.00 100	2.00	.625	.81	60°	3/8-16
		1.25 125	2.12	.750	1	—	3/8-16

	Style Code	Shank Dia.	G	H	J	K	L	R	W	Screw Size
LIGHT DUTY	ILRE	.250 025	See diagram above for 025 specifications 1/4-20							1/4-20
		.375 037	.375	.281	.906	.969	2.25	.38	1.25	3/8-16
		.500 050	.375	.281	.906	.969	2.25	.50	1.25	3/8-16
		.625 062	.375	.281	.906	.969	2.25	.56	1.25	3/8-16
		.750 075	.438	.344	1.125	1.000	2.50	.69	1.38	3/8-16
		.875 087	.438	.344	1.125	1.000	2.50	.75	1.50	3/8-16
		1.00 100	.438	.344	1.125	1.000	2.50	.81	1.62	3/8-16
		1.25 125	.560	.560	.875	1.125	2.37	1.00	1.87	3/8-16

CUSTOM HOLE RETAINER





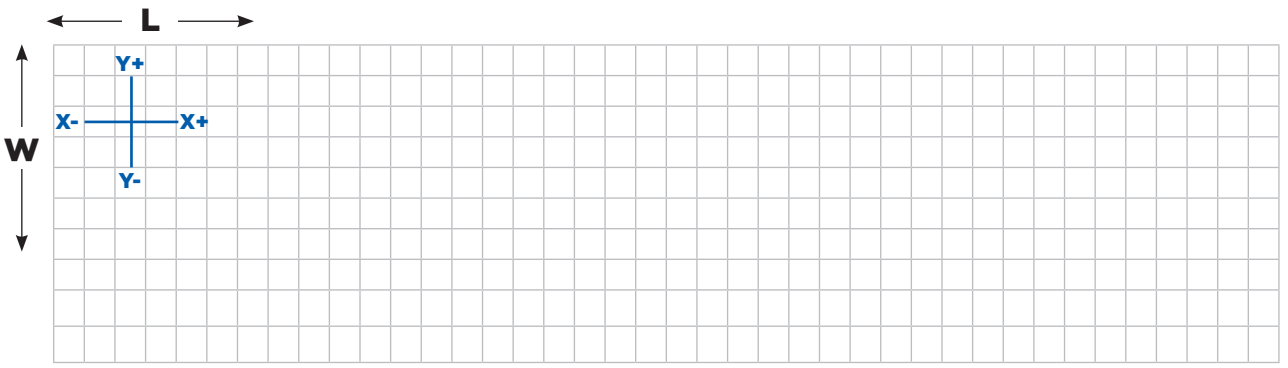
Manufactured with backing plate only.

Retainer		Catalog Number	Special Size			
	Heavy Duty		Length:		Width:	
	Light Duty					

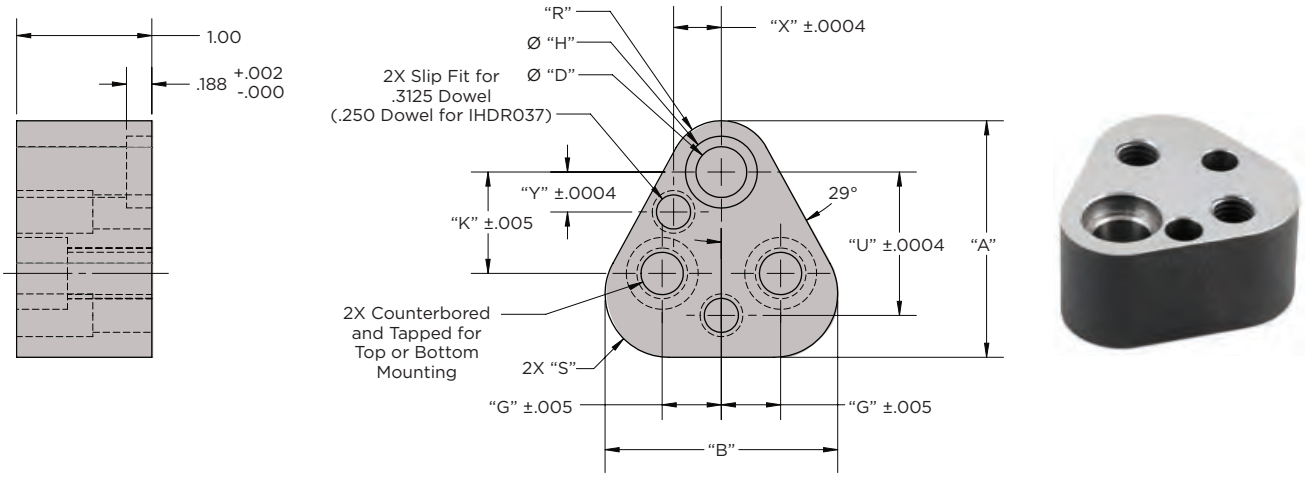
CUSTOM MULTI-HOLE RETAINERS
Multiple Ball Lock Punch Retainers

Hole Number	Component		Location		Ball Hole	
	Type	Size	X Axis	Y Axis	Location	Radial Tolerance

Wilson Tool accepts CAD drawings in DXF, DWG and IGS format.

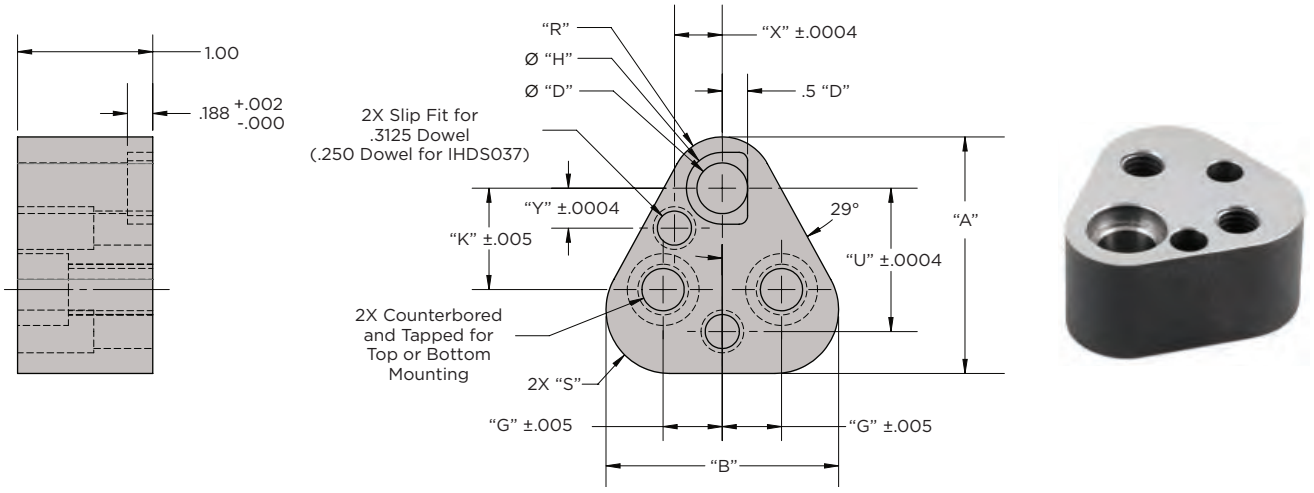


HEADED RETAINER



	IHDR — ROUND TIPS ONLY													
	Cat No.	D	H	A	B	G	K	R	S	U	X	Y	Screw Size	Tapped Hole
ROUND	**IHDR037**	.375	.526	1.75	1.72	.438	.750	.38	.47	1.060	.354	.295	5/16-18	3/8-16
	IHDR050	.5	.656	2.00	1.97	.562	.750	.50	.60	1.180	.472	.256	5/16-18	3/8-16
	IHDR062	.625	.781	2.12	2.09	.625	.750	.56	.66	1.250	.532	.236	5/16-18	3/8-16
	IHDR075	.75	.906	2.38	2.34	.688	.750	.69	.79	1.320	.650	.197	5/16-18	3/8-16
	IHDR100	1	1.156	2.75	2.72	.781	.938	.88	.97	1.600	.866	.276	1/2-13	5/8-11
	IHDR125	1.25	1.406	2.75	2.72	.781	.938	.88	.97	1.600	.866	.276	1/2-13	5/8-11

Note: Does not include backing plate or plug.



	IHDS — SHAPED TIPS ONLY													
	Cat No.	D	H	A	B	G	K	R	S	U	X	Y	Screw Size	Tapped Hole
SHAPE	**IHDS037**	.375	.526	1.75	1.72	.438	.750	.38	.47	1.060	.354	.295	5/16-18	3/8-16
	IHDS050	.5	.656	2.00	1.97	.562	.750	.50	.60	1.180	.472	.256	5/16-18	3/8-16
	IHDS062	.625	.781	2.12	2.09	.625	.750	.56	.66	1.250	.532	.236	5/16-18	3/8-16
	IHDS075	.75	.906	2.38	2.34	.688	.750	.69	.79	1.320	.650	.197	5/16-18	3/8-16
	IHDS100	1	1.156	2.75	2.72	.781	.938	.88	.97	1.600	.866	.276	1/2-13	5/8-11
	IHDS125	1.25	1.406	2.75	2.72	.781	.938	.88	.97	1.600	.866	.276	1/2-13	5/8-11

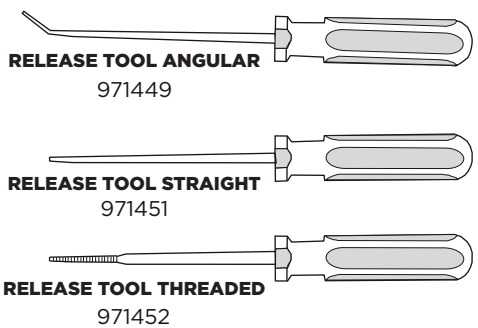
Note: Does not include backing plate or plug.

RETAINER ACCESSORIES

	IHRT Retainer Size	Socket Head Cap Screw	Pull Dowels		Ball Diameter	Ball Release Screw	Tru-Fasten Spring	Optional Stiff Spring	Inner Booster Spring
			Vented	Tapped					
HEAVY DUTY	.375 037	971 388 5/16-18 X 1-3/4	971385 3/16 x 3/4*	971386 1/4 x 3/4	971395 3/8	971428 8-32 x 1	971400	971402	972100
	.5 050	8166 3/8-16 x 2	971386 1/4 x 3/4"		971396 1/2	971428 8-32 x 1	971401	971403	972101
	.625 062	8166 3/8-16 x 2	971386 1/4 x 3/4"		971396 1/2	971428 8-32 x 1	971401	971403	972101
	.75 075	8166 3/8-16 x 2	971386 1/4 x 3/4"		971396 1/2	971428 8-32 x 1	971401	971403	972101
	.875 087	8166 3/8-16 x 2	971386 1/4 x 3/4"		971396 1/2	971428 8-32 x 1	971401	971403	972101
	1.0 100	6325 1/2-13 x 2	971386 1/4 x 3/4"		971396 1/2	971428 8-32 x 1	971401	971403	972101
	1.25 125	6325 1/2-13 x 2	971386 1/4 x 3/4"		971396 1/2	971428 8-32 x 1	971401	971403	972101

	ILRT Retainer Size	Socket Head Cap Screw	Pull Dowels		Ball Diameter	Ball Release Screw	Tru-Fasten Spring	Optional Stiff Spring	Inner Booster Spring
			Vented	Tapped					
LIGHT DUTY	.25 025	6618 5/16-18 x 1-1/2	971384 1/8 x 3/4*	971386 1/4 x 3/4	971393 1/4	971428 8-32 x 1	971397	N/A	972100
	.375 037	6618 5/16-18 x 1-1/2	971385 3/16 x 3/4*	971386 1/4 x 3/4	971393 1/4	971428 8-32 x 1	971397	N/A	972100
	.5 050	6391 3/8-16 x 1-1/2	971386 1/4 x 3/4"		971394 5/16	971428 8-32 x 1	971398	N/A	972101
	.625 062	6391 3/8-16 x 1-1/2	971386 1/4 x 3/4"		971394 5/16	971428 8-32 x 1	971398	N/A	972101
	.75 075	6391 3/8-16 x 1-1/2	971386 1/4 x 3/4"		971395 3/8	971428 8-32 x 1	971399	N/A	972101
	.875 087	6391 3/8-16 x 1-1/2	971386 1/4 x 3/4"		971395 3/8	971428 8-32 x 1	971399	N/A	972101
	1.0 100	971 391 1/2-13 x 1-3/4	971386 1/4 x 3/4"		971395 3/8	971428 8-32 x 1	971399	N/A	972101

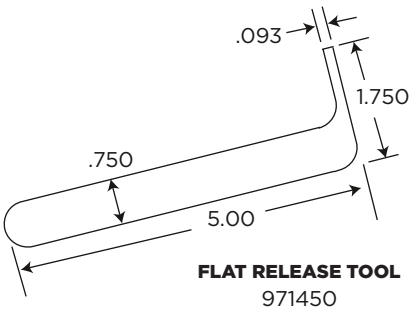
* 1/8" and 3/16" dowels are not tapped / vented



RELEASE TOOL ANGULAR
971449

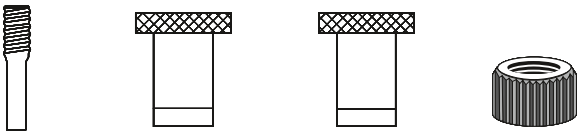
RELEASE TOOL STRAIGHT
971451

RELEASE TOOL THREADED
971452



FLAT RELEASE TOOL
971450

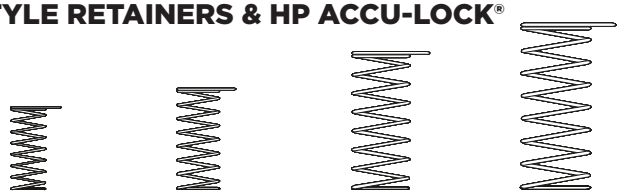
RETAINER ACCESSORIES

	IHRT Retainer Size	Backing Plugs			Jack Screw	For Manual Mounting, Prevents Chips From Entering Spring, Ball, Hole		Retainer Nuts
		In Line Dowel	Die Button	Solid		Drill Bushing	Ream Bushing	
HEAVY DUTY	.375 037	971409 .1875 hole	N/A	971423	971429 5/16-18 x 1-1/4	971433	971444	971438
	.5 050	971410 .250 hole	N/A	971424	971429 5/16-18 x 1-1/4	971434	971445	971439
	.625 062	971411 .250 hole	N/A	971425	971429 5/16-18 x 1-1/4	971435	971446	971439
	.75 075	971412 .250 hole	N/A	971426	971429 5/16-18 x 1-1/4	971436	971447	971439
	.875 087	971413 .250 hole	N/A	971427	971429 5/16-18 x 1-1/4	971437	971448	971439
	1.0 100	971406 .250 hole	N/A	971420	971429 5/16-18 x 1-1/4	971430	971441	971440
	1.25 125	971407 .250 hole	N/A	971421	971429 5/16-18 x 1-1/4	971431	971442	971440

	ILRT Retainer Size	Backing Plugs			Jack Screw	For Manual Mounting, Prevents Chips From Entering Spring, Ball, Hole		Retainer Nuts
		In Line Dowel	Die Button	Solid		Drill Bushing	Ream Bushing	
LIGHT DUTY	.25 025	971408 .125 hole	N/A	971422	971429 5/16-18 x 1-1/4	971432	971433	971438
	.375 037	971409 .1875 hole	N/A	971423	971429 5/16-18 x 1-1/4	971433	971444	971438
	.5 050	971410 .250 hole	971416 .312 hole	971424	971429 5/16-18 x 1-1/4	971434	971445	971439
	.625 062	971411 .250 hole	971417 .406 hole	971425	971429 5/16-18 x 1-1/4	971435	971446	971439
	.75 075	971412 .250 hole	971418 .531 hole	971426	971429 5/16-18 x 1-1/4	971436	971447	971439
	.875 087	971413 .250 hole	971419 .625 hole	971427	971429 5/16-18 x 1-1/4	971437	971448	971439
	1.0 100	971406 .250 hole	971414 .719 hole	971420	971429 5/16-18 x 1-1/4	971430	971441	971440

REPLACEMENT SPRINGS FOR BACKING PLATE STYLE RETAINERS & HP ACCU-LOCK®



250 S
1/4 SPRING
971380

312 S
5/16 SPRING
971381

375 S
3/8 SPRING
971382

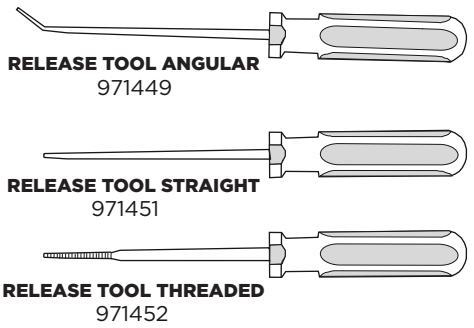
500 S
1/2 SPRING
971383

EASY SHARP TOOL		
SIZE	CAT. NO.	FITS PIN NO.
.061	971481	4, 6, 9, 12
.031	971482	2, 3
Set	971562	

RETAINER ACCESSORIES

	MHRT Retainer Size	Socket Head Cap Screw	Vented / Tapped Pull Dowels	Ball Diameter	Ball Release Screw	Tru-Fasten Spring	Optional Stiff Spring	Inner Booster Spring
HEAVY DUTY	10 010	30161 M8 x 40	972087 6 x 20	972032 10mm	972076 M4 x 25mm	972062 10mm	972064 10mm	972100
	13 013	30161 M8 x 40	972087 6 x 20	972033 12mm	972076 M4 x 25mm	972067 12mm	972066 12mm	972101
	16 016	30161 M8 x 40	972087 6 x 20	972033 12mm	972076 M4 x 25mm	972067 12mm	972066 12mm	972101
	20 020	30162 M10 x 45	972087 6 x 20	972033 12mm	972076 M4 x 25mm	972067 12mm	972066 12mm	972101
	25 025	970467 M12 x 50	972087 6 x 20	972033 12mm	972076 M4 x 25mm	972067 12mm	972066 12mm	972101
	32 032	970467 M12 x 50	972087 6 x 20	972033 12mm	972076 M4 x 25mm	972067 12mm	972066 12mm	972101
	40 040	970467 M12 x 50	972087 6 x 20	972033 12mm	972076 M4 x 25mm	972067 12mm	972066 12mm	972101

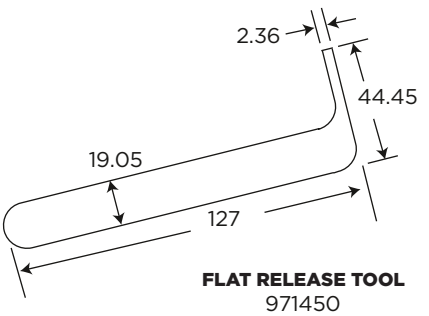
	MLRT Retainer Size	Socket Head Cap Screw	Vented/Tapped Pull Dowels		Ball Diameter	Ball Release Screw	Tru-Fasten Spring	Optional Stiff Spring	Inner Booster Spring
			Vented	Tapped					
LIGHT DUTY	6 006	970453 M6 x 35	972086 3 x 20		972030 6mm	972076 M4 x 25mm	972068 6mm	N/A	972100
	10 010	970451 M8 x 35	972087 6 x 20		972031 8mm	972076 M4 x 25mm	972069 8mm	N/A	972101
	13 013	970451 M8 x 35	972087 6 x 20		972031 8mm	972076 M4 x 25mm	972069 8mm	N/A	972101
	16 016	970451 M8 x 35	972087 6 x 20		972031 8mm	972076 M4 x 25mm	972069 8mm	N/A	972101
	20 020	43504 M10 x 35	972087 6 x 20		972031 8mm	972076 M4 x 25mm	972069 8mm	N/A	972101
	25 025	6112 M12 x 35	972087 6 x 20		972031 8mm	972076 M4 x 25mm	972069 8mm	N/A	972101
	32 032	6112 M12 x 35	972087 6 x 20		972031 8mm	972076 M4 x 25mm	972069 8mm	N/A	972101
	38 038	6112 M12 x 35	972087 6 x 20		972031 8mm	972076 M4 x 25mm	972069 8mm	N/A	972101



RELEASE TOOL ANGULAR
971449

RELEASE TOOL STRAIGHT
971451

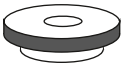
RELEASE TOOL THREADED
971452



FLAT RELEASE TOOL
971450

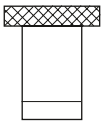
RETAINER ACCESSORIES

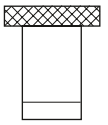
TYPE A



TYPE B

TYPE C





HEAVY DUTY

MHRT Retainer Size	Backing Plugs			Jack Screw	For Manual Mounting, Prevents Chips From Entering Spring, Ball, Hole		Retainer Nuts
	In Line Dowel	Die Button	Solid		Drill Bushing	Ream Bushing	
10 010	972019 6mm hole	N/A	972078	33588 M8 x 8	972042	972051	972059 8mm
13 013	971942 6mm hole	N/A	972079	33588 M8 x 8	972043	972052	972059 8mm
16 016	971943 6mm hole	N/A	972080	33588 M8 x 8	972044	972053	972059 8mm
20 020	971944 6mm hole	N/A	972081	33588 M8 x 8	972045	972054	972060 10mm
25 025	971945 6mm hole	N/A	972082	33588 M8 x 8	972046	972055	972061 12mm
32 032	971946 6mm hole	N/A	972083	33588 M8 x 8	972047	972056	972061 12mm
40 040	971948 6mm hole	N/A	972085	33588 M8 x 8	972049	972058	972061 12mm

LIGHT DUTY

MLRT Retainer Size	Backing Plugs			Jack Screw	For Manual Mounting, Prevents Chips From Entering Spring, Ball, Hole		Retainer Nuts
	In Line Dowel	Die Button	Solid		Drill Bushing	Ream Bushing	
6 006	972018 3mm hole	N/A	972077	33588 M8 x 8	972041	972050	972059 8mm
10 010	972019 6mm hole	N/A	972078	33588 M8 x 8	972042	972051	972059 8mm
13 013	971942 6mm hole	972035	972079	33588 M8 x 8	972043	972052	972059 8mm
16 016	971943 6mm hole	972036	972080	33588 M8 x 8	972044	972053	972059 8mm
20 020	971944 6mm hole	972037	972081	33588 M8 x 8	972045	972054	972060 10mm
25 025	971945 6mm hole	972038	972082	33588 M8 x 8	972046	972055	972061 12mm
32 032	971946 6mm hole	972039	972083	33588 M8 x 8	972047	972056	972061 12mm
38 038	971947 6mm hole	972040	972084	33588 M8 x 8	972048	972057	972061 12mm

REPLACEMENT SPRINGS FOR BACKING PLATE STYLE RETAINERS & HP ACCU-LOCK®

972070
6mm

972071
8mm

972072
10mm

972073
12mm

EASY SHARP TOOL		
SIZE	CAT. NO.	FITS PIN NO.
1.5	971481	4, 6, 9, 12
.78	971482	2, 3
Set	971562	

SPECIALS

SERVING A WIDE VARIETY OF INDUSTRIES

We have the ability to design and create an immense range of custom tooling. Our capability to provide innovative tooling design, precision manufacturing, advanced tool steels and state-of-the-art coatings makes us well-suited to create custom tooling solutions designed to meet the demands of a wide variety of industries.

SPECIAL TOOLING

- Mold & Die Cast Components
  - Custom Core Pins
  - Custom Ejector Pins
  - Trim Die Components
  - Custom Wire Work
- Special Machine Components
  - Locator Pins
  - Inspection Pins
  - Custom Components
- Jig & Fixture Components
  - Locating Pins/Bushings
  - Custom Clamping Components
- Die Industry
  - Die Blocks
  - Punch Pads
  - Pedestal Punches
- Letterstamp
  - Custom Steel Stamps
  - Logo stamps
  - Alpha/Numeric Stamps

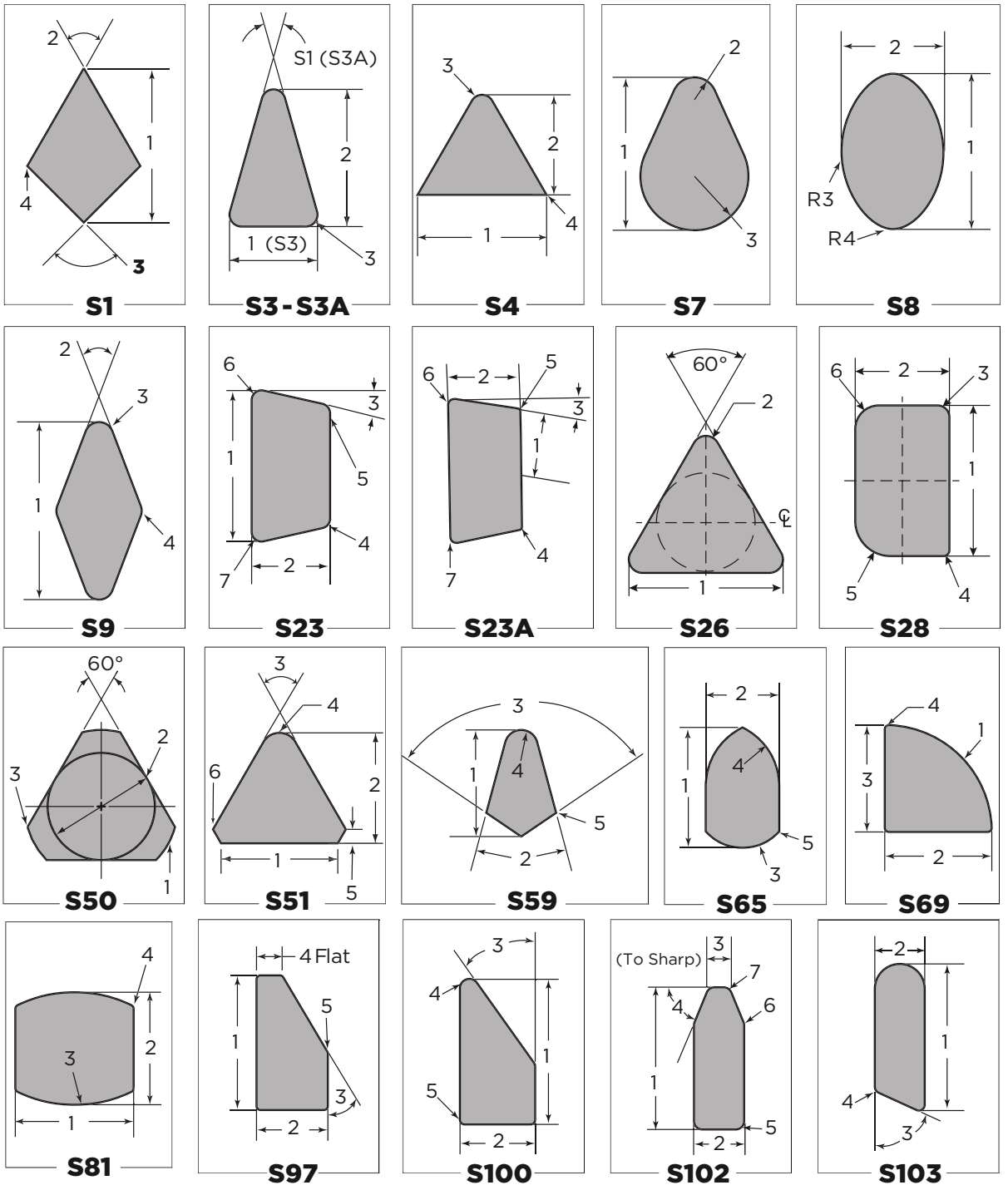
PROCESSES

- Tube Expansion
- Cold Forging/Heading
- Fastener Heading
- Broaching
- Extruding
- Drawing
- Fine Blanking
- Plastic Injection Molding
- Bending
- Stamping

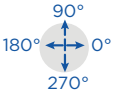
CAPACITY DETAILS	
Max. Length	15″
Max. Dia.	6″
Min. Length	.375″
Min. Dia.	.31″
Min. Tip Dia.	.007″

SPECIAL SHAPES — DIE VIEW

℄ = centerline **T.S.** = theoretical sharp **T.I.** = theoretical intersection GROUP 'A'



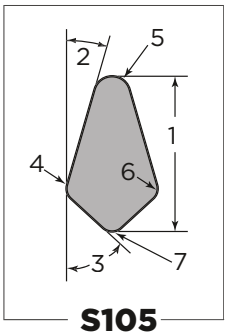
NOTE: If not specified: key will be located as shown on page 118-119. Alternate key locations at 15° increments are available for no additional charge. **Punches:** external radii will be .005" (.12mm) unless otherwise noted. **Dies/guides:** internal radii will be .007" (.18mm) unless noted. All shapes can be mirrored. Use die view when ordering tooling. **All shapes are centered on shank unless otherwise noted.**



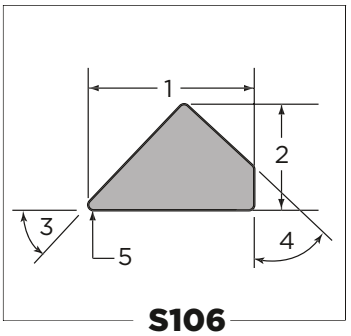
SPECIAL SHAPES — DIE VIEW

GROUP 'A'

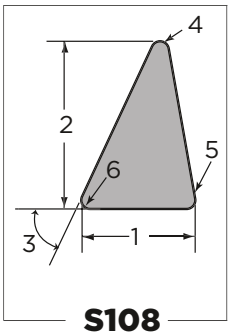
℄ = centerline **T.S.** = theoretical sharp **T.I.** = theoretical intersection



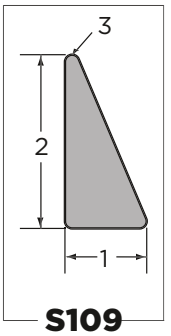
S105



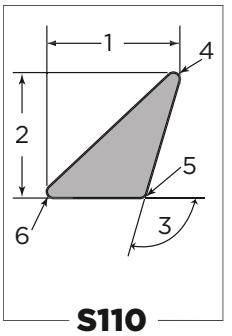
S106



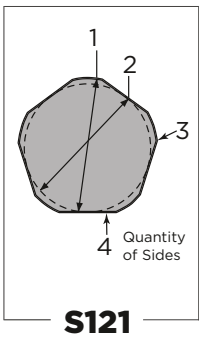
S108



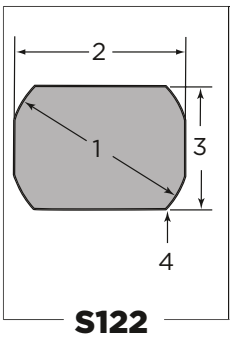
S109



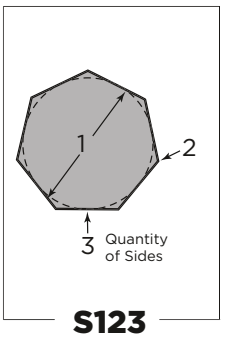
S110



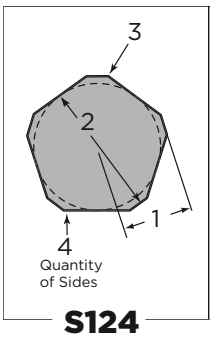
S121



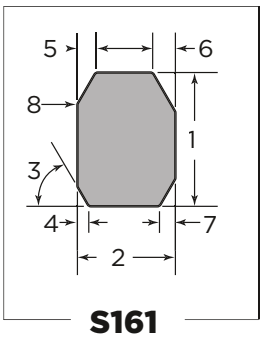
S122



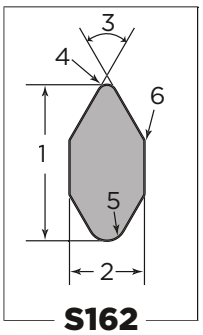
S123



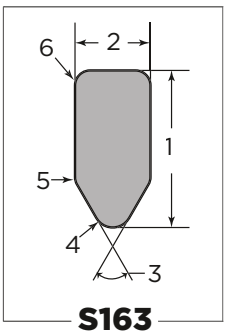
S124



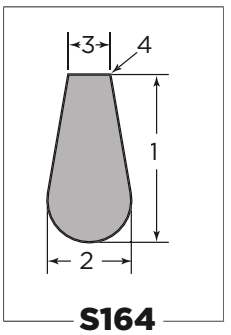
S161



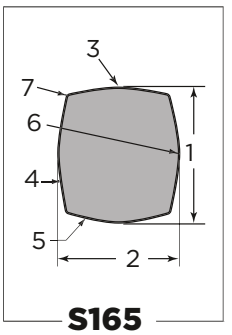
S162



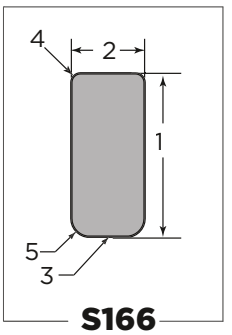
S163



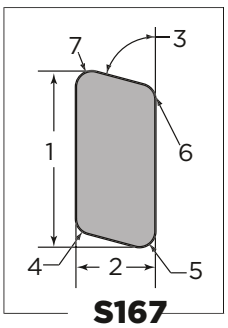
S164



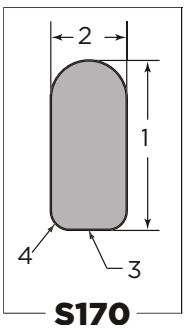
S165



S166

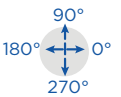


S167



S170

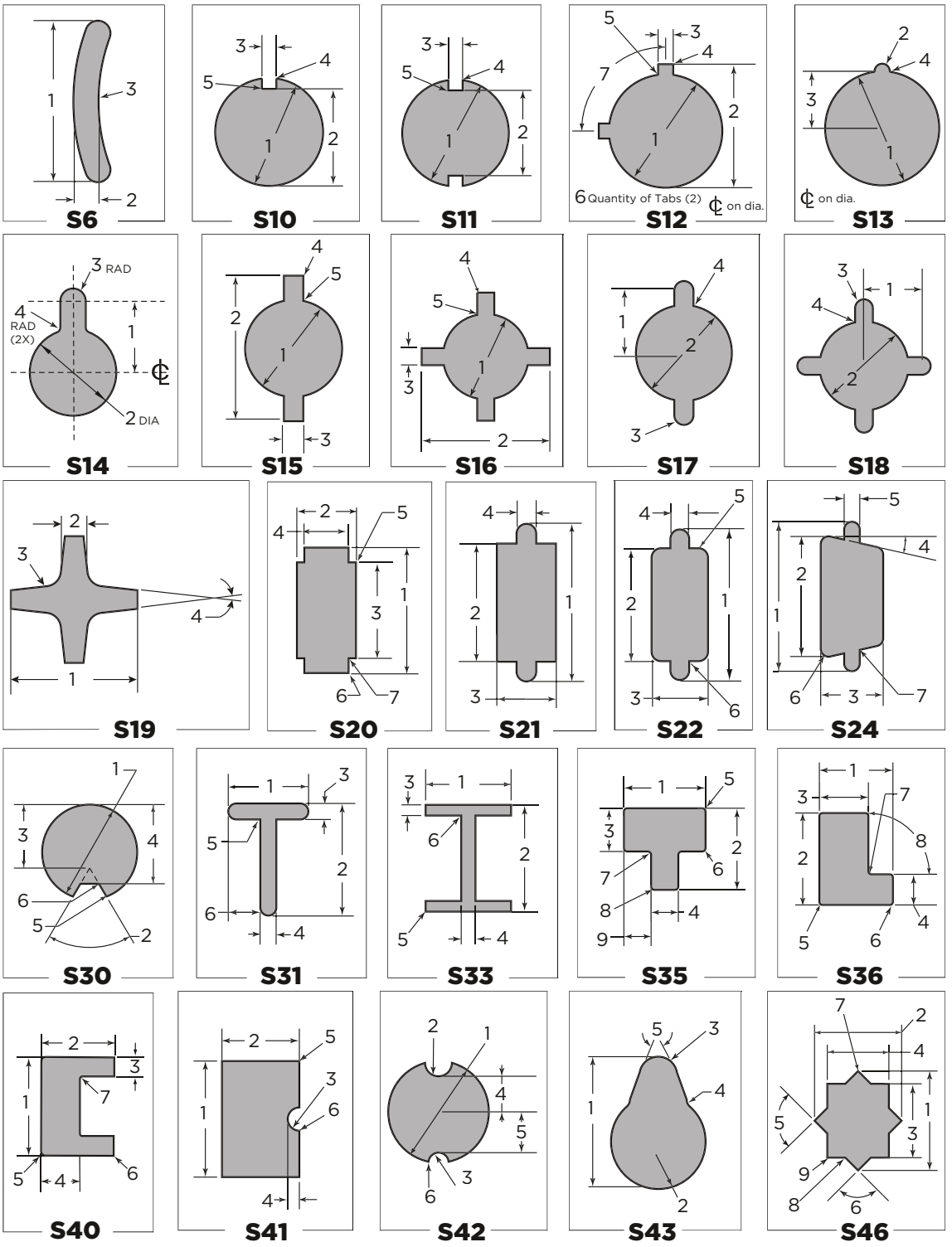
NOTE: If not specified: key will be located as shown on page 118-119. Alternate key locations at 15° increments are available for no additional charge. **Punches:** external radii will be .005" (.12mm) unless otherwise noted. **Dies/guides:** internal radii will be .007" (.18mm) unless noted. All shapes can be mirrored. Use die view when ordering tooling. **All shapes are centered on shank unless otherwise noted.**



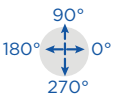
SPECIAL SHAPES — DIE VIEW

℄ = centerline **T.S.** = theoretical sharp **T.I.** = theoretical intersection

GROUP 'B'



NOTE: If not specified: key will be located as shown on page 118-119. Alternate key locations at 15° increments are available for no additional charge. **Punches:** external radii will be .005" (.12mm) unless otherwise noted. **Dies/guides:** internal radii will be .007" (.18mm) unless noted. All shapes can be mirrored. Use die view when ordering tooling. **All shapes are centered on shank unless otherwise noted.**

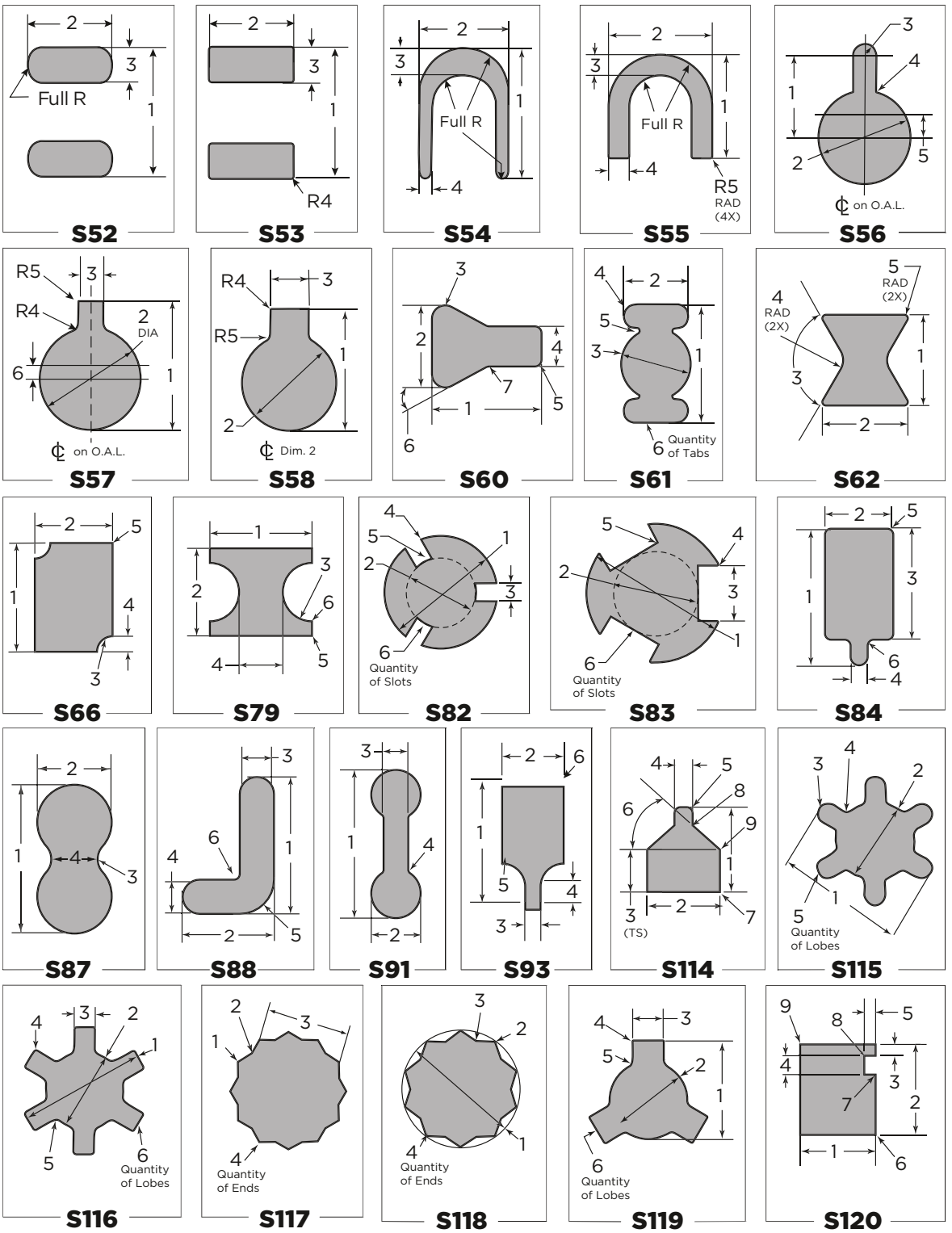


SPECIALS

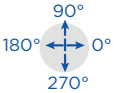
SPECIAL SHAPES — DIE VIEW

GROUP 'B'

℄ = centerline **T.S.** = theoretical sharp **T.I.** = theoretical intersection



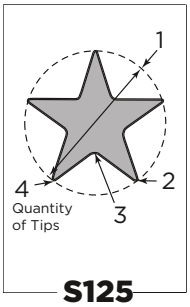
NOTE: If not specified: key will be located as shown on page 118-119. Alternate key locations at 15° increments are available for no additional charge. **Punches:** external radii will be .005" (.12mm) unless otherwise noted. **Dies/guides:** internal radii will be .007" (.18mm) unless noted. All shapes can be mirrored. Use die view when ordering tooling. **All shapes are centered on shank unless otherwise noted.**



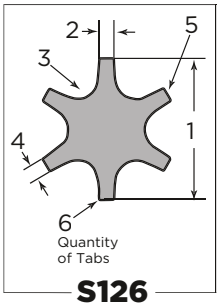
SPECIAL SHAPES — DIE VIEW

℄ = centerline **T.S.** = theoretical sharp **T.I.** = theoretical intersection

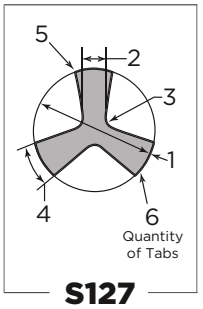
GROUP 'B'



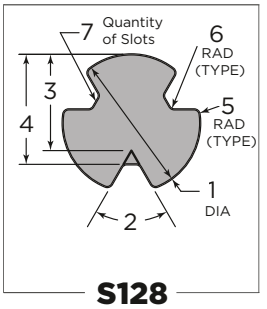
S125



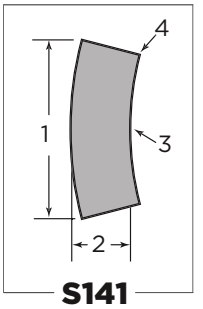
S126



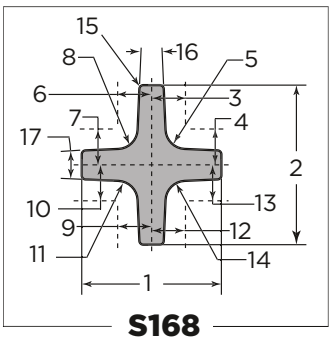
S127



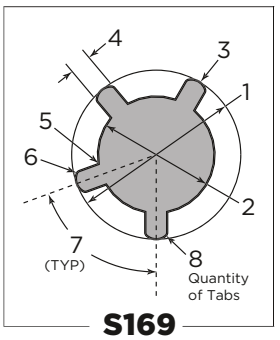
S128



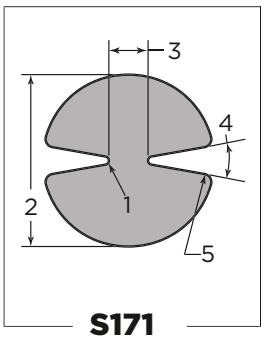
S141



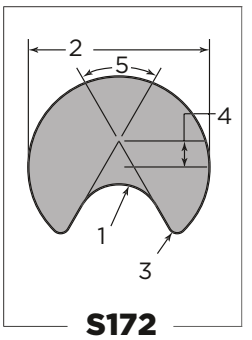
S168



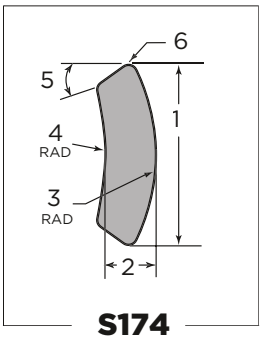
S169



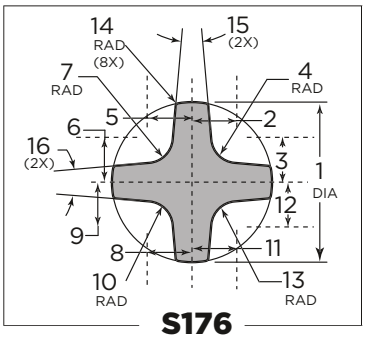
S171



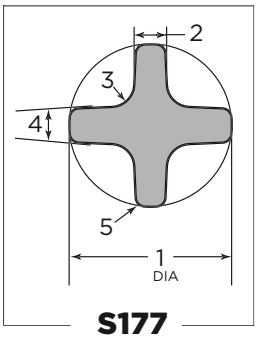
S172



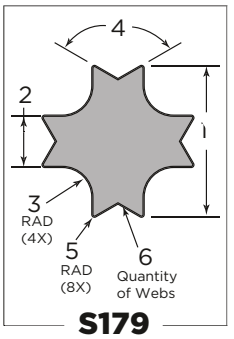
S174



S176

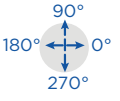


S177

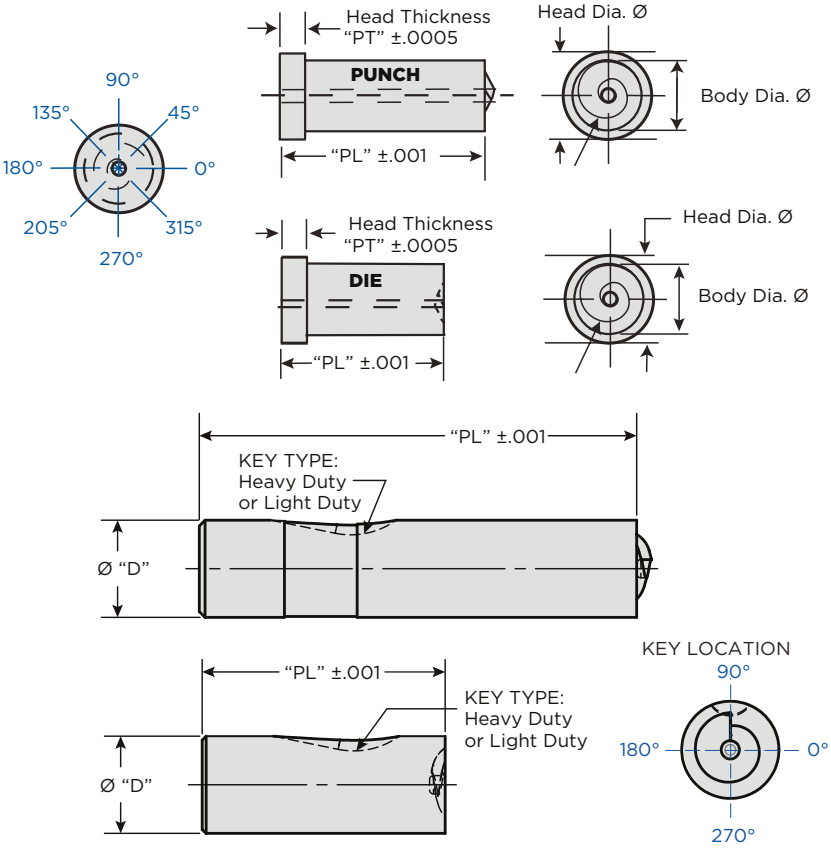


S179

NOTE: If not specified: key will be located as shown on page 118-119. Alternate key locations at 15° increments are available for no additional charge. **Punches:** external radii will be .005" (.12mm) unless otherwise noted. **Dies/guides:** internal radii will be .007" (.18mm) unless noted. All shapes can be mirrored. Use die view when ordering tooling. **All shapes are centered on shank unless otherwise noted.**



THREADFORMS



Thread Size [inch]	Metric Equivalent [mm]	Min. Punch Dia. for Given Thread Form inch [mm]
1/4 – 14	6.3 x 1.8	0.6250 [16]
1/4 – 20		0.6250 [16]
3/16 – 24		0.4375 [13]
5/16 – 12	8 x 2.1	0.7500 [20]
5/16 – 18		0.7500 [20]
3/8 – 16	10 x 1.5	0.7500 [20]
4 – 40		0.3750 [10]
6 – 18		0.3750 [10]
6 – 20	3.5 x 1.3	0.3750 [10]
6 – 32		0.4375 [13]
7 – 16		0.4375 [13]
8 – 15		0.4375 [13]
8 – 18	3.9 x 1.4	0.4375 [13]
8 – 32		0.4375 [13]
10 – 12		0.5000 [13]
10 – 16	4.8 x 1.6	0.4375 [13]
10 – 24		0.4375 [13]
10 – 32	5.0 x 0.8	0.4375 [13]
12 – 11		0.6250 [16]
12 – 14	5.5 x 1.8	0.6250 [16]
12 – 24		0.6250 [16]
14 – 10		0.6250 [16]

BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION	
Key Type	
Key Location	
'M' Dim	
Material Type & Thickness	
Thread Size	
REQUIREMENTS — PER DRAWING	
Punch Head Thickness	
Punch Length	
Punch Head Diameter	
Punch Body Diameter	
Die Head Thickness	
Die Length	
Die Head Diameter	
Die Body Diameter	

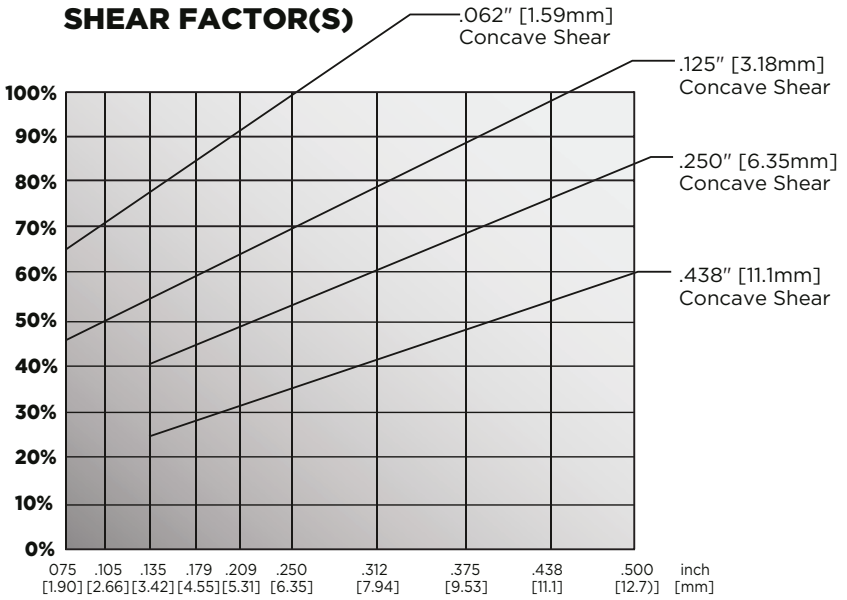
TONNAGE CALCULATION

MATERIAL THICKNESS				
NON-FERROUS			STEEL SHEETS	
Gauge Decimal [mm]	Gauge Decimal [inch]	GAUGE NO.	Gauge Decimal [mm]	Gauge Decimal [inch]
5.827	.2294	**3**	6.073	.2391
5.189	.2043	**4**	5.695	.22242
4.62	.1819	**5**	5.314	.2092
4.115	.162	**6**	4.935	.1943
3.665	.1443	**7**	4.554	.1793
3.264	.1285	**8**	4.176	.1644
2.906	.1144	**9**	3.797	.1495
2.588	.1019	**10**	3.416	.1345
2.30	.0907	**11**	3.03	.1196
2.052	.0808	**12**	2.657	.1046
1.829	.072	**13**	2.278	.0897
1.628	.0641	**14**	1.897	.0747
1.45	.0571	**15**	1.709	.0673
1.29	.0508	**16**	1.519	.0598
1.151	.0453	**17**	1.367	.0538
1.024	.0403	**18**	1.214	.0478
0.912	.0359	**19**	1.062	.0418
0.813	.032	**20**	0.912	.0359
0.724	.0285	**21**	0.836	.0329
0.643	.0253	**22**	0.759	.0299
0.574	.0226	**23**	.0683	.0269
0.511	.0201	**24**	0.607	.0239
0.455	.0179	**25**	0.531	.0209
0.404	.0159	**26**	0.455	0.179
0.361	.0142	**27**	0.417	.0164
0.32	.0126	**28**	0.378	.0149
0.287	.0113	**29**	0.343	.0135
0.254	.01	**30**	0.305	.012
0.226	.0089	**31**	0.267	.0105
0.203	.008	**32**	0.246	.0097
.108	.0071	**33**	0.229	.009
0.16	.0063	**34**	0.208	.0082
0.142	.0056	**35**	0.191	.0075

TONNAGE [Imperial]:
Total Perimeter **(P) x** Material Thickness **(T) x 25 x** Material Multiplication Factor **(F) x** Shear Factor (S).

TONNAGE [Metric]:
Total Perimeter **(P) x** Material Thickness **(T) x .0352 x** Material Multiplication Factor **(F) x** Shear Factor **(S)**

MATERIAL MULTIPLICATION FACTOR	
Material Description	Multiplier (F)
Aluminum – Soft Sheet	.3
Aluminum – Half Hard	.38
Aluminum – Hard	.5
Brass – Soft Sheet	.6
Brass – Half Hard	.7
Copper – Rolled	.57
Steel – Mild	1
Steel – ASTM A36	1.2
Steel – 50 Carbon	1.4
Steel – Cold Drawn	1.2
Steel – Stainless	1.4
Spring Steel – Tempered	4



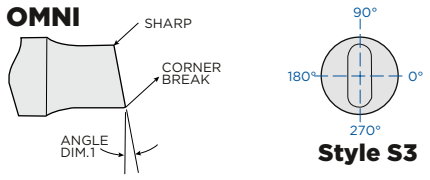
Shear Tonnage Chart:
To find the actual tonnage required when using a given shear, multiply the calculated tonnage by the percentage shown on the chart for a specified material thickness.

CLEARANCES			
	% TOTAL CLEARANCE		
Material	Minimum	Maximum	NOTES
Copper, 1/2 Hard	10	18	**Example:** .250" (6.3 mm) Mild Steel 20% or .050" (1.27mm). For material greater than .135" (3.4 mm) the "Maximum" column should be used.
Brass, 1/2 Hard	10	18	
Aluminum, Soft	10	18	
Mild Steel	14	20	
High Carbon Steel	14	24	
Stainless Steel	14	24	
% x Material Thickness = Total Clearance			

SHEAR & ALTERATION OPTIONS

SHEAR OPTIONS

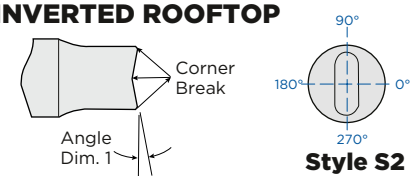
OMNI



Style S3

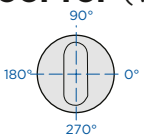
SL(Shear Location at high point) = _____°

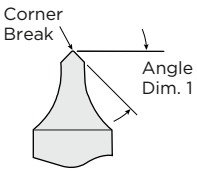
INVERTED ROOFTOP



Style S2

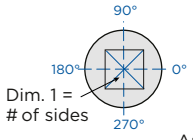
ROOFTOP (W)

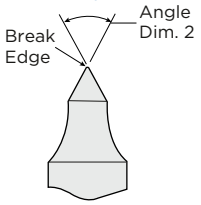




Style S1

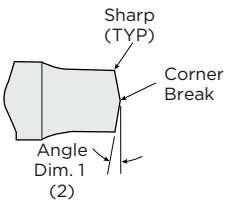
NAIL POINT

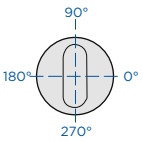




Style S6

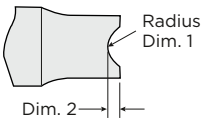
ROOFTOP (P)

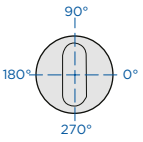




Style S4

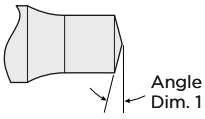
CONCAVE

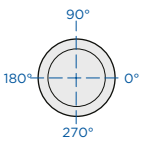




Style S5

CONICAL SHEAR





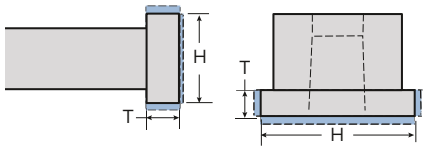
Style S7

ALTERATION OPTIONS

A2	Air hole 0.020 diameter
A3	Air hole 0.030 diameter
A4	Air hole 0.040 diameter
A6	Air hole 0.060 diameter
A9	Air hole 0.090 diameter
A12	Air hole 0.120 diameter
ABR	Blend radius for other than .500" [12.7mm] (rounds only)
ABRD	Point length: longer than longest std. Length (rounds only)
ABSH	Point length: longer than longest std. Length (shapes only)
AD	Reduce body diameter
ADL	Altered die land
AE	Ejector size — different than standard for punch
AH	Altered head diameter
AHR	Altered radius under head
AK	Add key to other than shape tool
AL	Overall length shorter (shorten shank, maintain point)
AP	Smaller than standard "P" (rounds)
ARD	Relief diameter other than standard (counterbore)
ART	Relief taper other than standard (per side)
AT	Altered head Thickness
AW	Smaller than standard "W" (shapes)
CR	Corner Radius
EBT	Extra back tape
HC	Head Chamfer – Option 1: Standard small (broke edge) – Option 2: 10° – Option 3: Custom (angle and depth dims required) – Option 4: None (sharp edge)
MK	Multiple keys
NS	No side hole — Ejector
PL	Precision overall length ±.001" [±.026]
PT	Precision head thickness ±.0005" [±.013]
SH2	Slug Hugger® 2
SH4L	Slug Hugger® 4L
SL	Shear location at high point on Omni Shear

ALTERATION INFORMATION

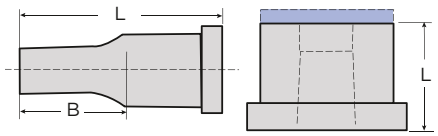
Alterations are for ranges beyond the sizes listed in catalog.



AT HEAD THICKNESS (T)
Stock altered from head end. Thinner head shortens overall length

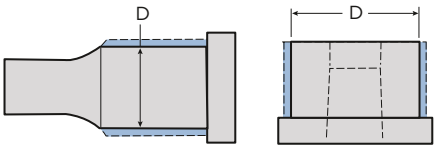
PT PRECISION HEAD (T)
Held to ±.0005" / [±.013 mm]

AH HEAD DIAMETER (H)
Maximum head diameter alteration is equal to the body size.



AL OVERALL LENGTH (L)
Shorter Length: Punch-shorten shank maintain point.
Headed Die — stock removed shortens land length.
Minimum Length: Dies — headless products = .250" [6.35mm]
Dies — headed products = .250 + T [6.35mm + T]

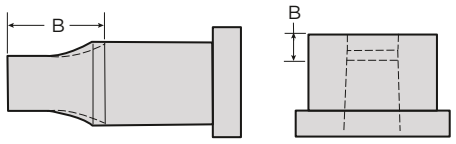
PL PRECISION LENGTH (L)
Held to ±.001" or ±.026mm



AD BODY DIAMETER (D)

	Body Diameter	12	18	25	31	37	43	50	62	75	87	100	125	150
Inch	Punch Min. D	.063	.126	.188	.251	.313	.376	.438	.501	.626	.751	.876	1.000	1.250
	Ejector Min. D		.172	.218	.282	.344	.376	.438	.563	.688	.751	.938	1.188	1.438
	Die Min. D		.157	.229	.282	.344	.407	.469	.563	.688	.813	.938	1.125	1.375

	Body Diameter	5	6	8	10	13	16	20	25	32	38	40
Metirc	Punch Min. D	4.4	5	6.8	8.8	11.5	14.5	18.5	23.5	30.5		
	Ejector Min. D											
	Die Min. D	3.5	5	6.5	8.5	11.5	14.5	18.5	23	30		

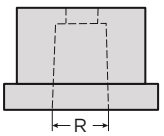


AB POINT LENGTH (B) PUNCHES
Longer than longest standard length. Shank length is shortened; overall length does not change (min. shank length .750" or 19.05mm).

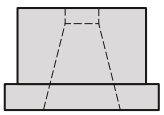
ADL LAND THICKNESS (B) DIES

Hole Size		Max. Land		Material Thickness		Land Thickness	
Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric
.031 – .062	.800 – 1.600	2P	3.2				
.062 – .093	1.601 – 2.400	.187	5				
.093 – .158	2.401 – 4.000	.250	6	.003 – .010	.080 – .254	.031	.787
.158 – .235	4.001 – 6.000	.312	8	.011 – .020	.279 – .508	.062	1.575
.235 – .300	6.001 – 8.000	.375	9.5	.021 – .030	.533 – .762	.093	2.36
.300 – .400	8.001 – 10.000	.437	11				
.400 – Over	10.001 – Over	.500	13				

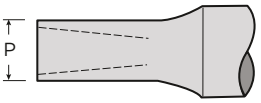
To minimize slug packing, land length should be shortened for material thickness under .030" [.762mm] or hole diameter under .250" [6.35mm].



ARD Relief diameter other than standard (counterbore)

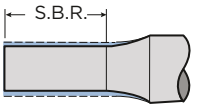


ART Relief taper other than standard



EBT EXTRA BACK TAPER
The stripping tonnage and the likelihood of galling are reduced by increasing the back taper on the punch tip.
Standard Taper:
For Tol. #1 = .0005"/inch/side [.013mm]
For Tol. #2 = .0001"/SBR/side [.003mm]

NBT NO BACK TAPER
Maintains exact punch diameter after sharpening tip for close tolerance work.



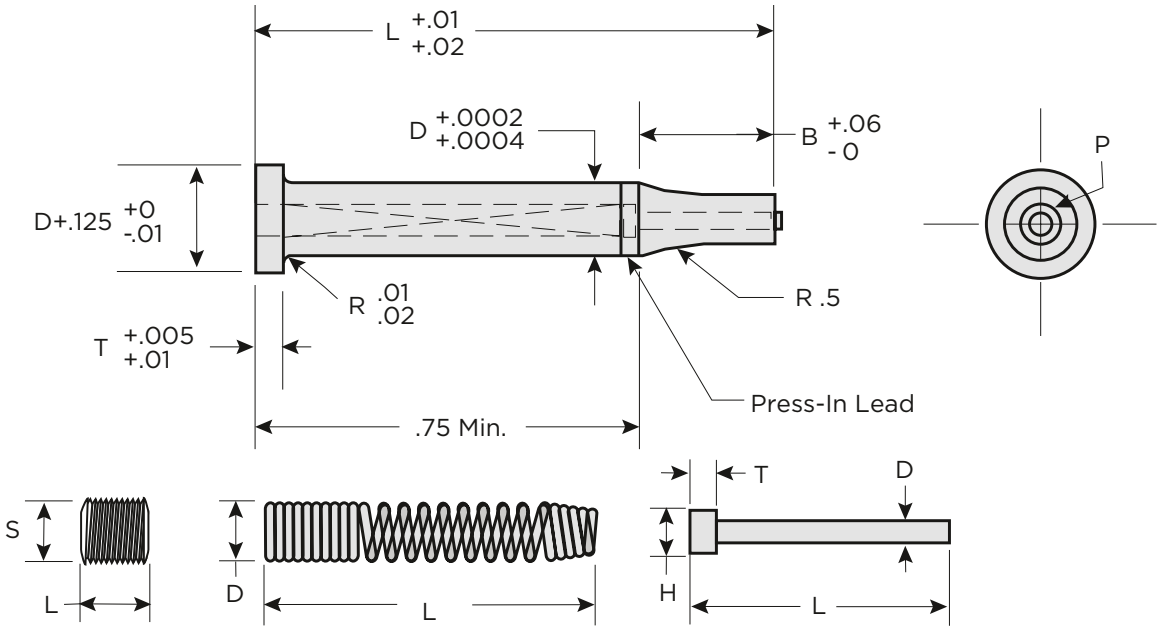
SBR STRAIGHT BEFORE RADIUS

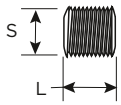
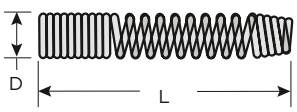
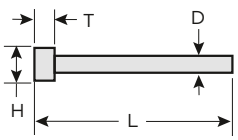
$$SBR = B - \sqrt{R^2 - (R - {}^{(D-P^*)}/_{2})^2}$$

*Use 'P' or 'W' whichever is smaller.

REFERENCE

EJECTOR COMPONENTS

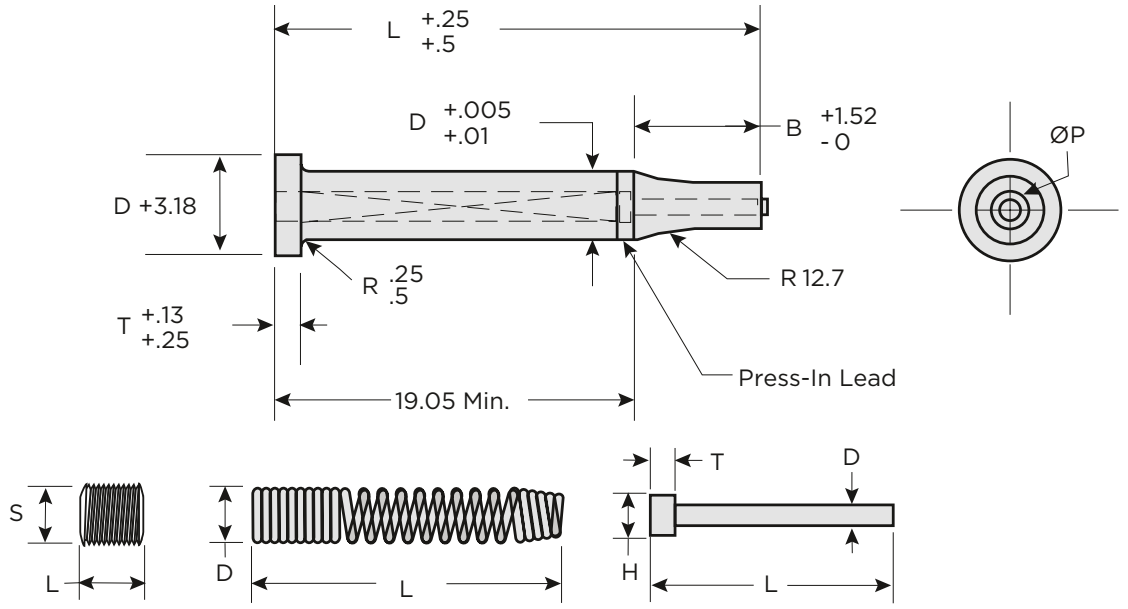


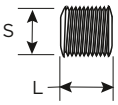
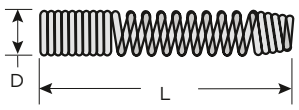
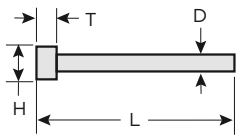
EJECTOR HOLE DIAMETER		.02	.032	.046	.063	.094	.125
SPRING HOLE DIAMETER		.086	.109	.141	.173	.221	.281
EJECTOR PIN EXTENSION		.031	.031	.06	.06	.06	.06
MINIMUM PUNCH DIAMETER (D)		.172	.218	.282	.344	.442	.552
MINIMUM POINT DIAMETER (P)		.05	.08	.115	.158	.235	.282
MAXIMUM SHANK LENGTH		3.375	3.375	3.375	4.25	4.25	4.25
MAXIMUM POINT LENGTH (B)		1.25	1.5	1.62	1.62	1.62	1.62
PART DESCRIPTION	**SET PART NO.**	**EJ2**	**EJ3**	**EJ4**	**EJ6**	**EJ9**	**EJ12**
	SCREW SIZE (S)	3-48	5-40	8-32	10-32	1/4-28	5/16-24
	LENGTH (L)	.187	.187	.187	.187	.25	.25
	DIAMETER (D)	.08	.104	.135	.165	.215	.27
	FREE LENGTH (L)	2.5	2.75	3.25	3.75	4	3.5
	PRESSURE (1/8 pre-load) (lbs.)	.5	.75	1	1.5	2	2.5
	HEAD DIAMETER (H)	.048	.073	.094	.12	.156	.188
	HEAD THICKNESS (T)	.031	.047	.062	.062	.094	.094
	PIN DIAMETER (D)	.015	.027	.041	.058	.089	.12
	LENGTH (L)	2	2	2	2	2.25	2.25

SPRINGS	PINS	SCREWS
EJ2SPRING	EJ2PIN	EJ2SCREW
EJ3SPRING	EJ3PIN	EJ3SCREW
EJ4SPRING	EJ4PIN	EJ4SCREW
EJ6SPRING	EJ6PIN	EJ6SCREW
EJ9SPRING	EJ9PIN	EJ9SCREW
EJ12SPRING	EJ12PIN	EJ12SCREW

INFORMATION NEEDED
Pre-packaged component sets include (10) set screws, (10) springs and (10) pins. The spring and pin are for the longest punch available for the set. User must cut the spring and pin to size for shorter length punches.

EJECTOR COMPONENTS

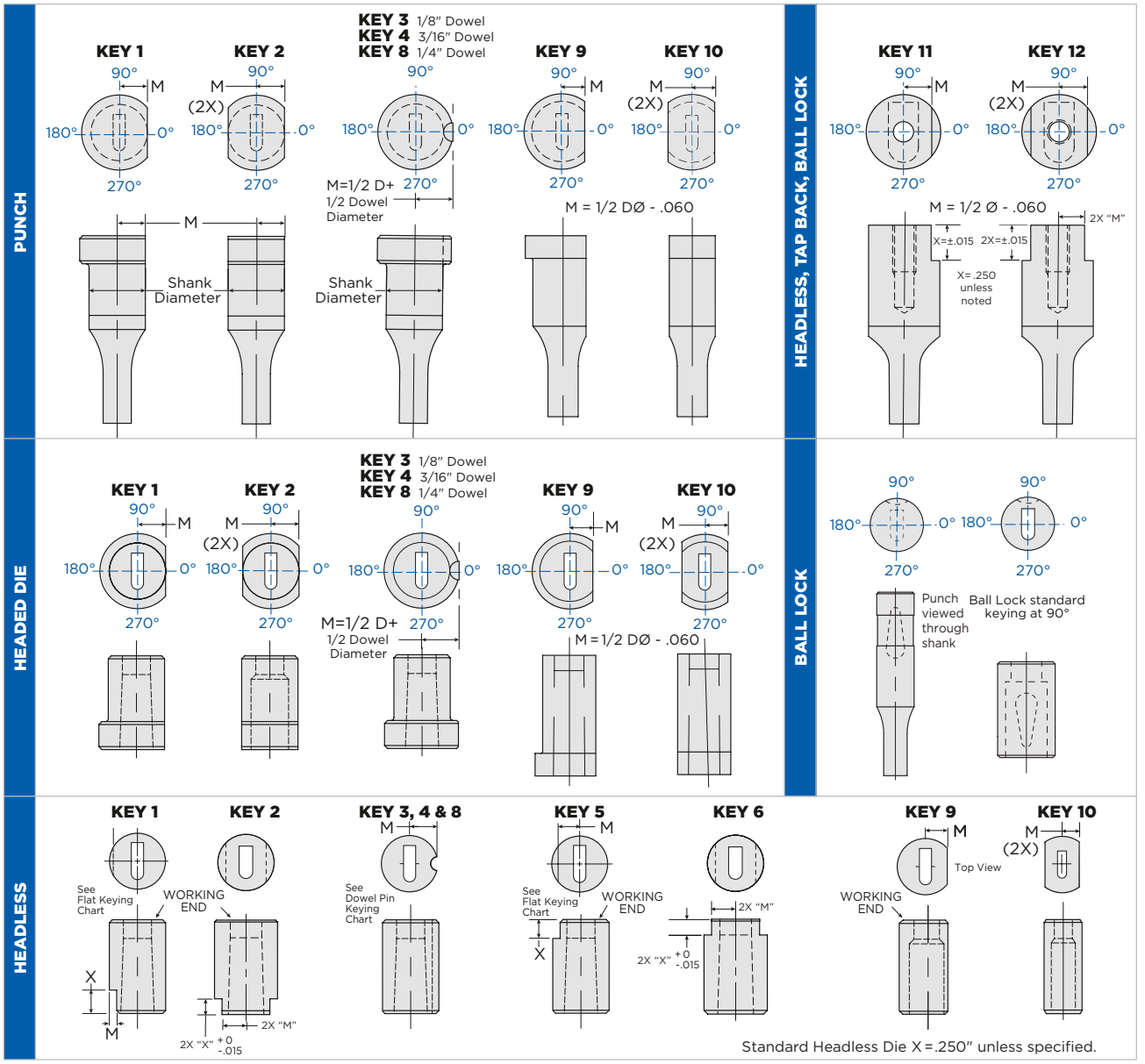


EJECTOR HOLE DIAMETER		.57	.81	1.17	1.6	2.39	3.18
SPRING HOLE DIAMETER		2.18	2.77	3.58	4.39	5.61	7.14
EJECTOR PIN EXTENSION		.79	.79	1.52	1.52	1.52	1.52
MINIMUM PUNCH DIAMETER (D)		4.37	5.54	7.16	8.74	11.23	14.02
MINIMUM POINT DIAMETER (P)		1.27	2.03	2.92	4.01	5.97	7.16
MAXIMUM SHANK LENGTH		85.73	85.73	85.73	107.95	107.95	107.95
MAXIMUM POINT LENGTH (B)		31.75	38.1	41.15	41.15	41.15	41.15
PART DESCRIPTION	**SET PART NUMBER**	**MEJ2**	**MEJ3**	**MEJ4**	**MEJ6**	**MEJ9**	**MEJ12**
	SCREW SIZE (S)	M2.5 x .45	M3 x .5	M4 x .7	M5 x .8	M6 x 1	M8 x 1.25
	LENGTH (L)	5	5	5	5	5	5
	DIAMETER (D)	2.03	2.64	3.43	4.19	5.46	6.86
	FREE LENGTH (L)	63.5	69.85	82.55	95.25	101.6	88.9
	PRESSURE (1/8 pre-load) (lbs.)	12.7	19.05	25.4	38.1	50.8	63.5
	HEAD DIAMETER (H)	1.22	1.85	2.39	3.05	3.97	4.78
	HEAD THICKNESS (T)	.79	1.199	1.58	1.58	2.39	2.39
	PIN DIAMETER (D)	.38	.69	1.04	1.47	2.26	3.05
	LENGTH (L)	50.8	50.8	50.8	50.8	57.15	57.15

INFORMATION NEEDED
Pre-packaged component sets include (10) set screws, (10) springs and (10) pins. The spring and pin are for the longest punch available for the set. User must cut the spring and pin to size for shorter length punches.

SPRINGS	PINS	SCREWS
EJ2SPRING	EJ2PIN	MEJ2SCREW
EJ3SPRING	EJ3PIN	MEJ3SCREW
EJ4SPRING	EJ4PIN	MEJ4SCREW
EJ6SPRING	EJ6PIN	MEJ6SCREW
EJ9SPRING	EJ9PIN	MEJ9SCREW
EJ12SPRING	EJ12PIN	MEJ12SCREW

KEYING INFORMATION



DOWEL PIN KEYING

M = D/2 + 1/2 dowel diameter: Headed punches, & and guides.
M dim.: Headless dies, headless punches & guides (see chart).

Dia.	25	31	37	43	50	62	75	87	100	125-275
KEY 3	.1625	.1875	.2125	.2375	.2625	D/2	D/2	D/2	D/2	D/2
KEY 4	.1938	.2188	.2438	.2688	.2938	D/2	D/2	D/2	D/2	D/2
KEY 8	.225	.250	.275	.300	.325	.3438	.4063	.4688	.5313	D/2

FLAT KEYING (unless otherwise specified)

Key 1 & 2 M = D/2: Headed punches, dies & guides.
Key 9 & 10 M= D/2– .060" Headed punches, dies & guides, Headless punches.
M dim.: Headless dies, guides & working end keys (see chart).

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

BALL LOCK KEY TOLERANCE

	RADIAL
Tolerance 1	0° 4′
Tolerance 2	0° 2′

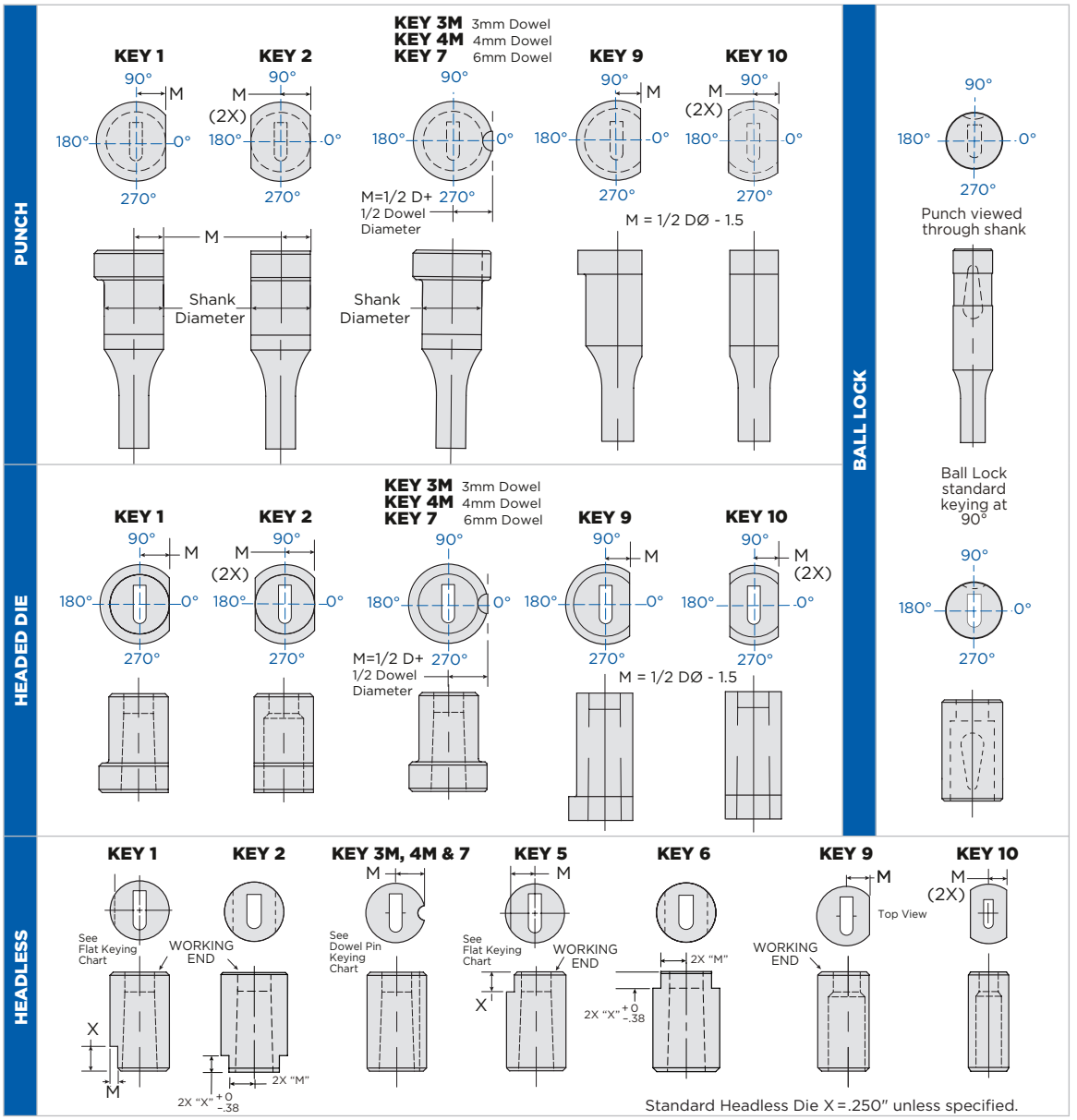
DOWEL KEY TOLERANCE

	'M'	RADIAL
Tolerance 1	+.0005 -0	0° 4′
Tolerance 2	+.0002 -0	0° 2′

FLAT KEY TOLERANCE

	'M'	RADIAL
Tolerance 1	+.0005 -0	.001/inch
Tolerance 2	+.0002 -0	.005/inch

KEYING INFORMATION



DOWEL PIN KEYING

M = D/2 + 1/2 dowel diameter: Headed punches, dies and guides.
M dim.: Headless dies, headless punches and guides (see chart).

Dia.	5	6	8	10	13	16	20	22	25	32-71
KEY 3M	3.5	3.9	4.7	5.5	6.7	D/2	D/2	D/2	D/2	D/2
KEY 4M	4	4.4	5.2	6	7.2	D/2	D/2	D/2	D/2	D/2
KEY 7	5	5.4	6.2	7	8.2	D/2+1	D/2+1	D/2+1	D/2+1	D/2

FLAT KEYING (unless otherwise specified)

Key 1 & 2 M = D/2: Headed punches, dies and guides.
Key 9 & 10 M=D/2 – 1.5mm: Headed punches, dies & guides, Headless punches.
M dim.: Headless dies, guides and working end keys (see chart).

D	5	6	8	10	13	16	20	22	25
M	2.2	2.6	3.5	4.3	5.6	6.9	8.7	9.5	10.8
D	32	38	40	45	50	56	63	71	
M	13.8	16.5	17.4	19.5	21.7	24.2	27.3	30.7	

BALL LOCK KEY TOLERANCE

	RADIAL
Tolerance 1	0° 4′
Tolerance 2	0° 2′

DOWEL KEY TOLERANCE

	'M'	RADIAL
Tolerance 1	+.013 -0	0° 4′
Tolerance 2	+.005 -0	0° 2′

FLAT KEY TOLERANCE

	'M'	RADIAL
Tolerance 1	+.013 -0	.03/30
Tolerance 2	+.005 -0	.01/20

ACCESSORIES

UNIKIX® EJECTOR ASSEMBLIES

UNIKIX® Spring Pins are manufactured with a hardened steel rod soldered to a compression spring. These ejector assemblies are used to prevent slug pulling, prevention of sheet metal being held against the stripper by stamping-fluid adherence and ejecting slugs after cutoff. The unique assembly design does allow for you to cut UNIKIX ejector assemblies to suit any application.

Cat. No.	Assembly
971591	#2 Unikix Ejector Assembly
971592	#3 Unikix Ejector Assembly
971593	#4 Unikix Ejector Assembly
971594	#6 Unikix Ejector Assembly
971595	#9 Unikix Ejector Assembly
988119	GP-148 Unikix Ejector Assembly

Pin	Pin Hole	Spring	Spring Hole	Screw
.020 Dia. x 3	.025	.082 Dia. x 2	.086	3-48 x 3/16
.026 Dia. x 3	.031	.105 Dia. x 2-1/4	.190	5-40 x 3/16
.041 Dia. x 3	.046	.140 Dia. x 2-1/2	.144	8-32 x 3/16
.055 Dia. x 4	.062	.162 Dia. x 2-3/4	.166	10-32 x 3/16
.086 Dia. x 4	.094	.217 Dia. x 3	.221	1/4-28 x 1/4
.148 Dia. x 4	.156	.308 Dia. x 3-1/2	.312	3/8-48 x 5/16

TOOLING STORAGE CABINETS

989826

989827

Storage systems from Wilson Tool International provide safe, efficient tool access to help increase performance. Keep your tooling protected from damage with cabinets that are tailored to suit your needs. Maximize your productivity with well organized tools that are easy to locate and identify for efficient setup and a speedy return to their designated location.

Cabinet Specifications

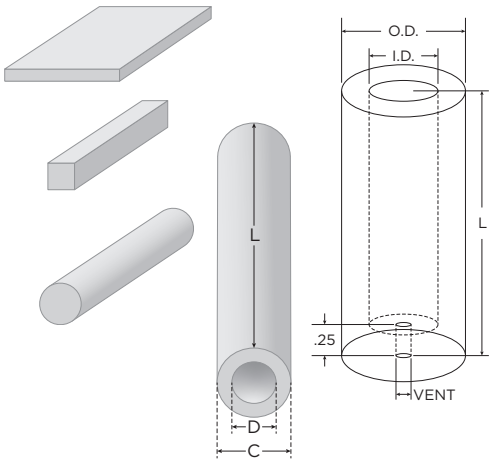
- High-capacity, PVC-lined drawers use an integrated, one-drawer-at-a-time locking system
- Ergonomic design ensures operator safety
- Secure, enclosed storage helps to maintain tool condition
- Stationary cabinets have a 2-inch recessed base to prevent toe kicks
- Mobile base style includes 6-inch casters,a side handle and an integrated lock-in mechanism on drawer handle
- Custom cabinet colors available on request (price to be quoted)

Cat. No.	W x D x H	Est. Weight	Drawer Sizes*
989826	30" x 27" x 42" [76.2 x 68.5 x 106.6cm]	540 lbs.	6 - 3" [76.2mm] 2 - 5" [127.0mm] 1 - 8" [203.2mm]
989825	30" x 27" x 47.5" [76.2 x 68.5 x 120.6 cm]	556 lbs.	

*Alternate drawer configurations available upon request.

ACCESSORIES

URETHANE PRODUCTS



Wilson Tool offers a wide range of urethane products for all of your stamping needs. In addition to the standard thicknesses and widths of the sheets, bars, rods and strippers, custom urethane is available upon request.

Urethane Strippers
Strip the blank cleanly from the punch with these high holding pressure urethane strippers. Simply push the stripper onto the punch shank and the first stroke of the press forces the punch tip through stripper bottom.

Urethane Tubes & Springs
Useful in applications where vibration, corrosion and magnetism prevent the use of steel springs.

Solid Urethane
Sheets, bars & rods are available in stock or custom sizes. Precision cast for tighter control of urethane thickness than open cast.

Stocked in 95A durometer. Other durometers are available.

MILFAB CAM PUNCH UNITS

Take the vertical motion of your press and turn it into horizontal punching with a Milfab Cam Unit. The Milfab Pos-Z-Cam is a powerful compact positive return cam designed to maximize die runtime. Milfab Cam Units use investment cast hardened steel components which guarantees consistency, performance, and long life cycles.

XSHARP™ GRINDER

Automated Tool Sharpening form the Provider You Trust

Sharpening your tooling is simpler and faster with the innovative XSharp™ grinder from Wilson Tool.

Cat. No. 987328

The benefits of accurate regrinding include:

- Longer tool life for reduced tooling costs
- No scrap or wasted material due to tooling malfunction
- Reduce wear on your springs, die and press

Fully Automated Grinding Process

- Simple to operate; no previous grinding experience required
- Touchscreen controller with user-friendly multi-language interface for easy operation (language can be selected during machine setup)
- Automated height detection feature locates the top of any tool mounted in the chuck before the grinding cycle begins
- Automatic compensation makes up for any grinding wheel wear

Suitable for Most Tooling Styles: Flexible range of chucks and adapters allows for sharpening most punch press tooling styles

Precision: AC-servo motor drives a precision gear and ball screw with dual linear guides and four carriers to provide highly stable bearing properties

Shear Grinding Chuck: For sharpening punches with shears (included)

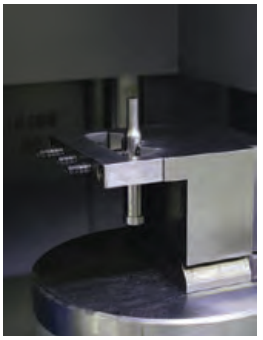
Closed Coolant System: Ensures the tool is constantly flooded with coolant during the grinding process

Interlocking Safety Guard: Opens and closes automatically

Frame: Heavy-duty cast-iron frame for durability, stability and long life

Small Footprint: Machine can easily be placed next to the punch press

5 EASY STEPS TO A SHARPER EDGE



Step 1. Load tool into chuck

Step 2. Set tool style

Step 3. Set tool size

Step 4. Set grind amount (in increments of 0.001" or 0.01mm)

Step 5. Touch start to sharpen the tool

XSHARP™ ACCESSORIES	
DESCRIPTION	**CAT. NO.**
Grinding Wheel	55109
Coolant	55367
Dressing Stone	55117

XSHARP™ TECHNICAL SPECIFICATIONS*			
MACHINE HEIGHT	77.2" (1962mm)	**AIR PRESSURE SUPPLY**	6 bar
MACHINE WIDTH	31.5" (800mm)	**GRINDING MOTOR POWER**	3HP/2.2 kW
MACHINE DEPTH	30.7" (779mm)	**WHEEL ROTATION SPEED**	2800 rpm
MACHINE WEIGHT	992 lbs./450kg	**TABLE MOTOR POWER**	.24HP/.18 kW
MAXIMUM TOOL DIAMETER	6.3" (160mm)	**TABLE ROTATION SPEED**	40 RPM
MAXIMUM TOOL HEIGHT	9" (230mm)	**COOLANT PUMP POWER**	.21HP/0.16 kW
POWER SUPPLY	230V, 60Hz	**COOLANT PUMP WATER FLOW**	Max. 11.5GPM 40 l/min

*Wilson Tool International reserves the right to change machine specifications without prior notice.

NITROGEN GAS SPRINGS

Designed for high-production operations, these premium nitrogen springs provide longer spring life, and are the safest on the market with regard to overpressure, overstroke and uncontrolled speed — which helps stampers reduce the risk of injury and tooling damage. Also, Special Springs are performance guaranteed, so your purchase is risk-free!

SAME DAY SHIPPING

Place your spring order by 3:00pm (EST) and receive same-day shipping on over 25,000 in-stock items.

INTERCHANGEABILITY

Springs are interchangeable with competitive brands.

SAFETY

Springs are fully compliant with all regulations and feature the latest safety innovations including:
Over Stroke Active Safety (OSAS)
Uncontrolled Speed Active Safety (USAS)
Over Pressure Active Safety (OPAS)

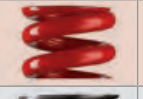
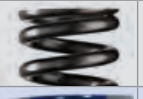
SPECIAL SPRINGS

Scan QR Code to view the Special Springs Conversion Guide

DIE SPRINGS

Engineered with a simple design, and manufactured with high-quality materials to give you longer life, all die springs are color-coded per ISO standards for quick & easy identification of duty rating. Sizes range from 0.375" to 2.50" in diameter and work with all types of punch and die components.

- **Special Springs Standard**
- **ISO Standard**
- **Round Wire**
- **Precompressed Units**
- **US-NAAMS Standard**
- **JIS B5012**
- **Same Day Shipping**
- **Interchangeability**
- **No Miniumum Order**

VL		Light Green Verde Claro Verte Claire		Super-Light Super-Ligero Extra-Légère	30% L_0
V		Green Verde Verte		Light Ligero Légère	25% L_0
B		Blue Azul Marino Bleue		Medium Medio Moyenne	25% L_0
R		Red Rojo Rouge		Heavy Fuerte Forte	20% L_0
G		Yellow Amarillo Jaune		Extra-Heavy Extra-Fuerte Extra-Forte	17% L_0
A		Silver Plateado Argent		Ultra-Heavy Ultra-Fuerte Ultra-Forte	10% L_0
T		Titanium Titanio Titane		Super-Strong Super-Fuerte Super-Forte	Max Fo Short Defl
W		White Blanco Blanc		Hyper-Strong Hyper-Fuerte Hyper-Forte	5% L_0
TV		Green Verde Verte		Light Ligero Légère	25% L_0
TB		Blue Azul Blue		Medium Medio Moyenne	25% L_0
TR		Red Rojo Rouge		Heavy Fuerte Forte	20% L_0
L		Not painted Muelles no pintados Ressorts non peints		—	16% L_0
RMBL		Silver-Blue Plateado-Azul Argent-Bleu		Light Ligero Légère	25% L_0
RMHR		Silver-Red Plateado-Rojo Argent-Rouge		Medium Medio Moyenne	20% L_0
RHGO		Silver-Gold Plateado-Oro Argent-Or		Heavy Fuerte Forte	15% L_0
RXHG		Silver-Green Plateado-Verde Argent-Verte		Extra-Heavy Extra-Fuerte Extra-Forte	15% L_0

Scan QR Code to view the Die Springs Catalog

See our Special Springs catalog for available options.

Visit **wilsontool.com** or consult with your sales engineer.

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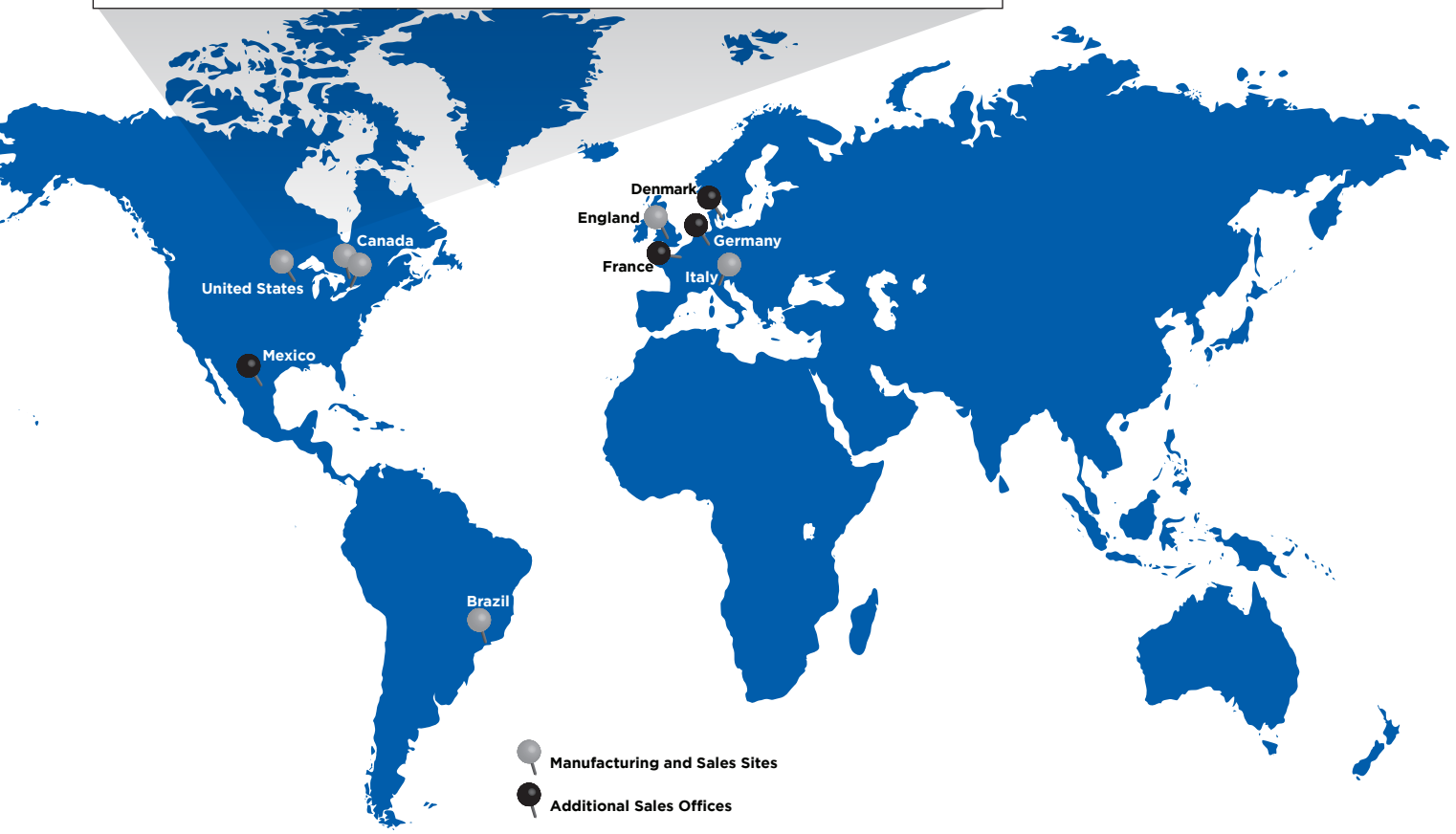

GUARANTEED TO OUTPERFORM

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

*The products in this catalog are manufactured in a plant whose quality management system is certified or registered as conforming to the requirements defined in the ISO 9001 Standard.

WILSON TOOL

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