

MOELLER

PRECISION TOOL

YOUR GLOBAL PARTNER FOR STANDARD & SPECIAL DIE COMPONENTS

- PUNCHES
- DIE BUTTONS
- RETAINERS

CERTIFIED
ISO
9001:2008



INCH CATALOG

VALUE • QUALITY & SERVICE • TECHNOLOGY



Our commitment to continuous improvement is reflected in true innovation in our management, processes, equipment and facilities. We take pride in our reputation of excellent service, quality performance, value and the understanding that our own interests are best served when we best service our customers.



CONVENIENCE - Fast, courteous, personalized attention to accommodate your special or emergency requirements.

CONFIDENCE - Performance guaranteed products, SPC controlled and ISO audited to exceed the industry's highest standards.

VALUE - The latest technology and innovative processes provide the world's highest performance tools priced to help your bottom line.



YOUR GLOBAL PARTNER FOR STANDARD & SPECIAL DIE COMPONENTS

Policies, Terms & Conditions	2
Delivery Schedule	3
Catalog Nomenclature & Ordering Examples	4

BALL LOCK PUNCHES HEAVY DUTY

IH_ Solid with Standard Point	5
IE_ Ejector with Standard Point	6
IH_ Pilots	7
I_B Blanks	8
IN_ Nose Large Solid with Standard Point	9
IW_ Nose Large Ejector with Standard Point	10

BALL LOCK PUNCHES LIGHT DUTY

IL_ Solid with Standard Point	11
IJ_ Ejector with Standard Point	12
IL_ Pilots	13
I_B Blanks	14
IO_ Nose Large Solid with Standard Point	15
IV_ Nose Large Ejector with Standard Point	16

BALL LOCK PUNCHES EXTRA HEAVY DUTY

IX_ Solid with Standard Point	17
IXB Blanks	18

SHOULDER PUNCHES BASIC

IS_ Solid with Standard Point	19
IC_ Ejector with Standard Point	20
IS_ Pilots	21
ISW Compact Pilot / Pointed Type	22
ISV Compact Pilot / Straight Type	22
I_B Blanks	23

SHOULDER PUNCHES SELECTIVE

IP_ Solid with Standard Point	24
IY_ Ejector with Standard Point	25
IP_ Pilots	26
IPW Compact Pilot / Pointed Type	27
IPV Compact Pilot / Straight Type	27
I_B Blanks	28

REDUCED SHANK PUNCHES

IPX Solid	29
IYX Ejector	29

DURA PUNCHES

XIS_ Solid with Standard Point	30
XIC_ Ejector with Standard Point	31
XI_B Blanks	32

QUILL PUNCHES

IQS Square Head	33
IQB Bevel Head	33

PRESS FIT BUTTONS

ID_ Counter Bore Relief with Standard Hole	34
ID_ Counter Bore Relief / Extended Range	35
IU_ Ultra Life/Taper Relief with Standard Hole	36
IU_ Ultra Life/Taper Relief / Extended Range	37

SHOULDER BUTTONS

IL_ Counter Bore Relief with Standard Hole	38
IM_ Ultra Life/Taper Relief with Standard Hole	39

BALL LOCK BUTTONS

IB_ Counter Bore Relief with Standard Hole	40
IF_ Ultra Life/Taper Relief with Standard Hole	41

BUTTON BLANKS

I_B Press Fit with Counter Bore Relief	42
I_B Press Fit with Straight Thru Hole	43
I_B Ball Lock with Counter Bore or Straight Thru Hole	44

UNIVERSAL SHAPES

I_U	45, 46, 47
-----------	------------

THREAD FORM TOOLING

I_Q Thread Form Tooling	48
-------------------------------	----

RETAINERS

IR_ True Set	49
IR_ Economy Round True Set	50
IR_ Square Type	51
IR_ End Type	52
IRX Extra Heavy Duty	53
Special Multi Hole Ball Lock	54
IR_ Shoulder True Set	55
XIRN Round Dura Punch Retainer	56
XIRO Shaped Dura Punch Retainers	56

RETAINER ACCESSORIES / COMPONENTS

Retainer Components	57
Retainer Accessories	58

URETHANE

ITO Strippers Open End	59
ITC Strippers Closed End	60
Sheets, Bars, Rods, Specials	61

EJECTOR COMPONENTS

STANDARD ALTERATIONS

Locating Devices	63, 64
Out of Range "P" "W" or "B"	65, 66
Button Slug Control	66
Overall Length or Head Dimension	67

SPECIAL ALTERATIONS

Shears, Extrusions, Shank Reduction	68
---	----

TECHNICAL TOPICS

Ball Lock Space Requirements	69
Clearances	70
Surface Treatment Selector	70

PERFORMANCE ENHANCERS

POLICIES, TERMS AND CONDITIONS



Moeller's "Purchase With Confidence" Guarantee!

- Customer satisfaction is Moeller's ultimate goal.
- Moeller was the first domestic punch manufacturer to receive its ISO certification. Moeller products are manufactured to NAPMA, NAAMS or other recognized industrial standards and are 100% interchangeable with all competing brands.
- Moeller uses only the highest commercially available grades of high speed and tool steels. The products are heat treated to exacting specifications then processed on some of the best equipment in the industry.
- Moeller products are warranted to meet or exceed the performance of like products from competing brands. If a customer is unsatisfied, Moeller will replace or allow the customer to return the product for full credit.

Over Shipments/Under Shipments:

Because of normal part losses due to machining set-up, Moeller requires that an over or undershipment of $\pm 10\%$ be allowed on quantities of 13 pieces or more.

Partial Shipments:

Standard line items are batched and shipped according to the latest line item due. Specials are shipped according to line item due dates.

Note: Moeller will accommodate any partial shipment as requested by the customer.

Returns:

1. Catalog items that are custom ground to customer specifications are often non reusable; Moeller will apply discretion for a 15% credit for reusable items.
2. Unused, off the shelf items such as punch blanks and standard retainers can be returned for a 15% restocking charge. The item must be in the original packaging in resalable condition.
3. Special "make-to-print" items are not returnable.
4. Moeller reserves the discretion for all returns exceeding one year from invoice date.

Method of Shipment:

Moeller ships UPS or Federal Express whenever possible, unless weight requirements dictate truck delivery, or as specifically requested by the customer.

Cancellation:

If labor or material has been applied to a cancelled job, a prorated charge will be billed.

Prices/Standards:

See current price supplement in effect.

Prices/Specials:

Per factory quotation good for 90 days or as specified.

Terms:

Net 30 days, F.O.B. our plant, 1½% per month late payment charge. U.S. dollars.

Moeller "Customer Service Stock" Program:

Moeller is pleased to offer an exclusive Service Stock Program to select customers. The "Customer Service Stock" program offers many benefits to our valued customers, including product cost reduction, immediate "on hand" availability, and reduced customer inventory costs. Moeller will manufacture your annual or semi-annual requirements for Pierce Tooling and Die Components and make them available for immediate shipment. The parts are billed only as shipped. A written purchase order is required with inventory set-up and parts must be released in the subsequent year. Please contact your Moeller Sales Representative for more details.

- Moeller reserves the right to modify, correct or improve this literature or products without notice.

DELIVERY SCHEDULE/ EXPEDITED SERVICES



STANDARD DELIVERY

SAME DAY/1 DAY:

- Punch and Button Blanks, Standard Retainers and All Other Stocked Products

3 WORKING DAYS:

- Standard In-Range Punches and Die Buttons Includes one Standard Alteration
- Quantities of 23 Pieces or Less

5 WORKING DAYS:

- Nose Large Punches & Ultralife Buttons over 1-1/2" Diameter Includes one Standard Alteration
- Quantities of 7 Pieces or Less

10 WORKING DAYS:

- Universal Shaped Punches and Die Buttons, Quill Punches & Closed End Strippers
- Press Fit Counter Bore Relief Extended Range Die Buttons

PERFORMANCE ENHANCER:

- TiN, TiCN, MOST, CDF, MSP, TiAlN, Alcrona
- NOTE: 2-10 Additional Work Days to the Standard Delivery Date

ORDERS MUST BE RECEIVED BEFORE 11:00AM EST (OR AS APPROVED BY A CUSTOMER SERVICE REPRESENTATIVE) TO BE CONSIDERED A WORK DAY.

QUANTITIES LARGER THAN 23 PIECES MAY REQUIRE ADDITIONAL LEAD TIME. CUSTOMER SERVICE REPRESENTATIVE MUST CONSULT FACTORY.

E.D.S. EXPEDITED DELIVERY SERVICE Products Shipped Earlier Than Standard Delivery

LEAD TIME:

- As Negotiated with a Customer Service Representative

QUALIFYING PRODUCTS:

- All Standard Catalog Items

COST:

- List Price + 25% Net
- Minimum Order = \$25.00

N.D.S. NEXT DAY SERVICE Standard Products Received by 5:30 p.m. EST Will Ship Next Day

QUALIFYING PRODUCTS:

- Round Piercing Products (excluding Ultra Life)

REQUIRED SPECIFICATIONS:

1. N.D.S. Items MUST be on an Independent Order (i.e. they must be separate from other delivery items)
2. Service Limited to Quantities of 1-20 Pieces
3. MUST be within Standard Catalog Range
4. Customer MUST Specify Next Day Service
5. Customer SHOULD Specify Method of Shipment (e.g. UPS, UPS Next Day Air, Pick Up, etc.)

COST:

- No Additional Charge

REQUIRED SPECIFICATIONS MUST BE CLEARLY STATED ON INDEPENDENT PURCHASE ORDER(S) TO GUARANTEE NEXT DAY SERVICE.

S.D.S. SAME DAY SERVICE

LEAD TIME:

- Orders MUST be received before 11:00 a.m. EST or as approved by a Customer Service Representative

QUALIFYING PRODUCTS:

1. Catalog Standard Products with Only One Standard Alteration
2. Round Products - 20 Piece Maximum
Shaped Products - 10 Piece Maximum
3. Coating Excluded
4. Excluded Products:
 - Nose Large Punches, Large Buttons, Urethane, Close Space or Quill Punches
 - Some Descriptive Shaped Products

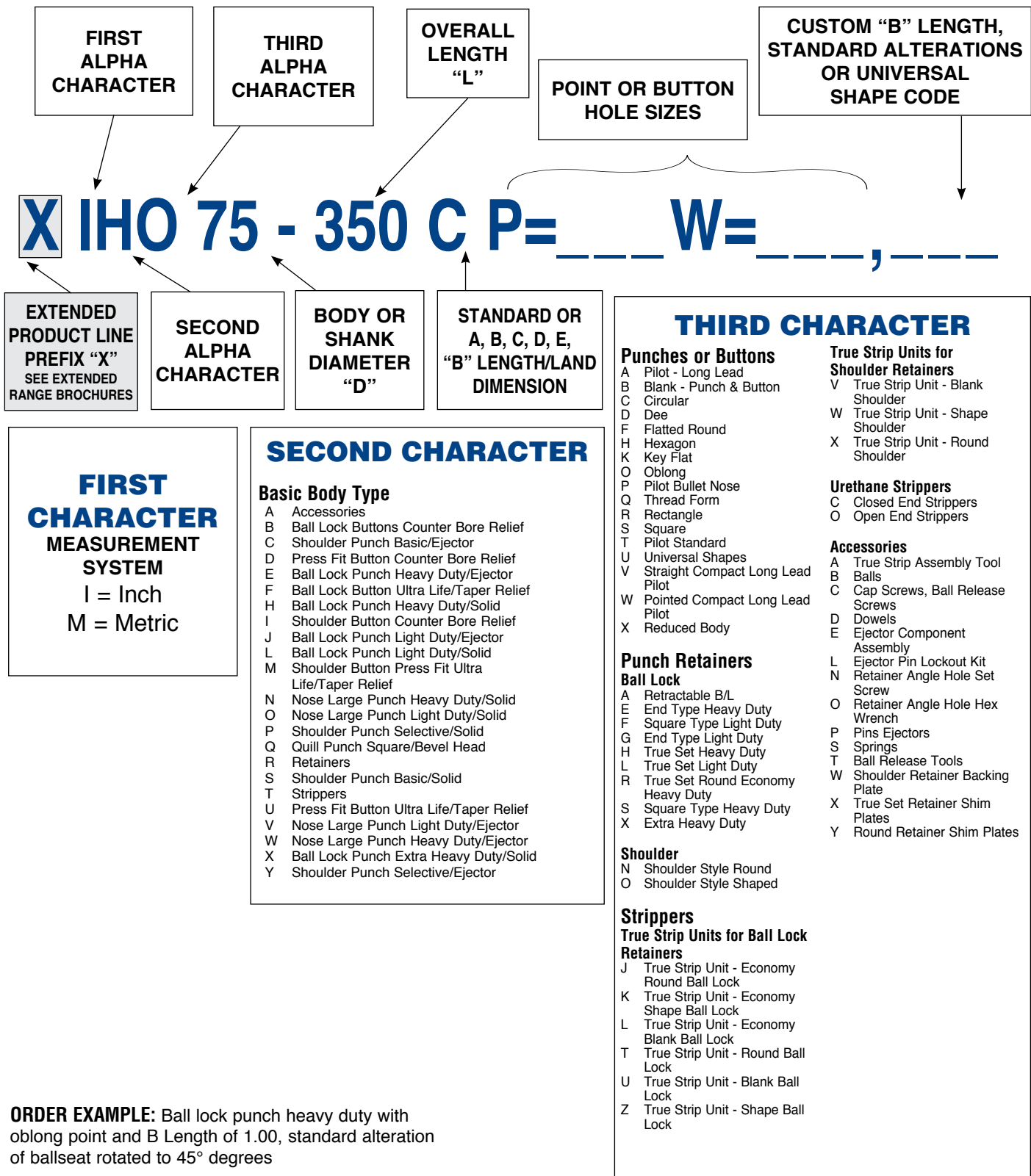
COST:

- List Price + 50% Net
- Minimum Order = \$50.00

CUSTOMER SERVICE REPRESENTATIVE MUST RECEIVE APPROVAL FROM EITHER PRODUCTION CONTROL MANAGER OR PLANT SUPERINTENDENT.

CATALOG NOMENCLATURE

MOELLER
PRECISION TOOL



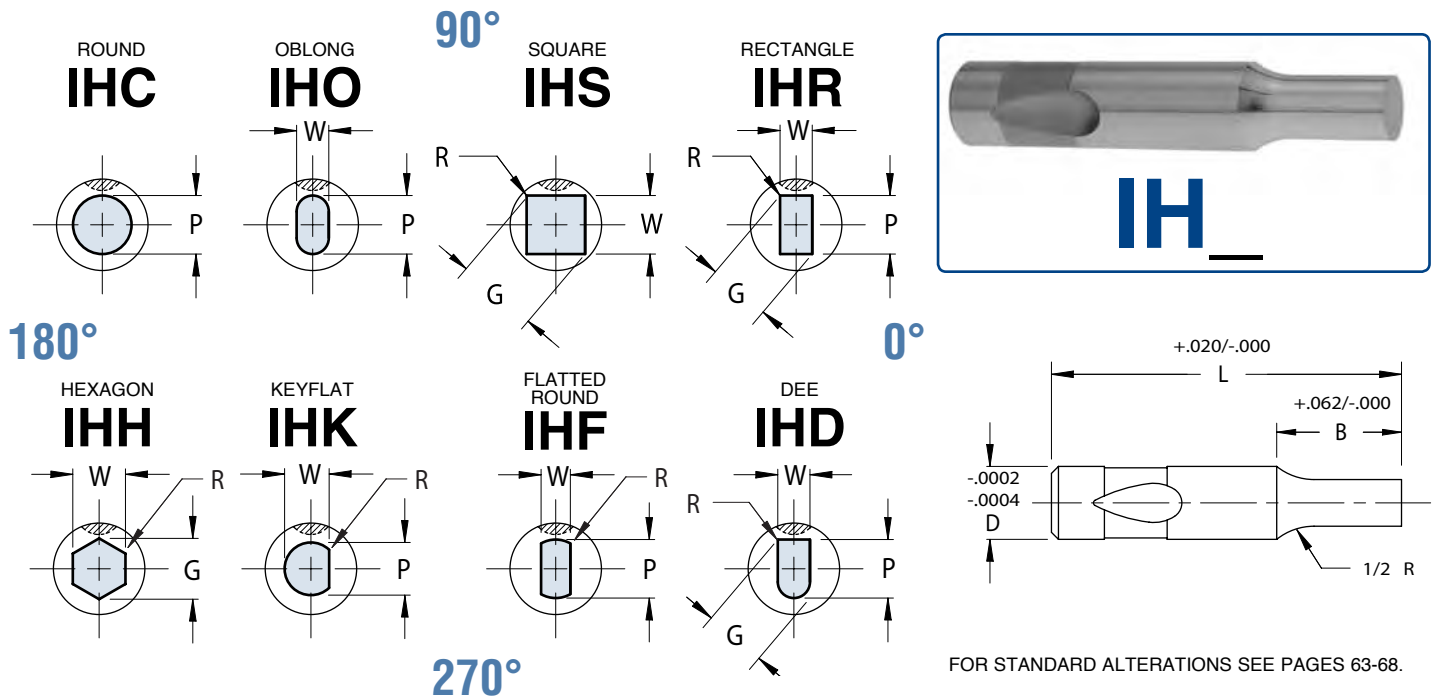
ORDER EXAMPLE: Ball lock punch heavy duty with oblong point and B Length of 1.00, standard alteration of ballseat rotated to 45° degrees

IHO 75-350C P=.625 W=.325 BS@45°

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

BALL LOCK PUNCHES

HEAVY DUTY/SOLID



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCD.COM

CATALOG TYPE	SHANK D	ROUND	SHAPE		OVERALL LENGTH "L"													
		RANGE P	MIN W	MAX G/P	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.50	6.00	7.00
IH_ 37	.375	.125-.374	.125	.375	X	X	X	X	X	X	X	X	X	X	X	X	X	
IH_ 50	.500	.187-.499	.187	.500	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IH_ 62	.625	.312-.624	.250	.625	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IH_ 75	.750	.437-.749	.312	.750	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IH_ 87	.875	.625-.874	.375	.875		X	X	X	X	X	X	X	X	X	X	X	X	X
IH_ 100	1.000	.750-.999	.437	1.000			X	X	X	X	X	X	X	X	X	X	X	X
IH_ 125	1.250	1.000-1.249	.500	1.250			X	X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\pm .0005$
- .0000

Shape P, W $\pm .0005$

	.0005	P to D
	.001	P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE

EXAMPLE: 4 IHC 50 5.00 1.00 .435 X1 = 4.85

EXAMPLE: 8 IHO 87 4.50 .75 .750 x .625 B/S @ 45

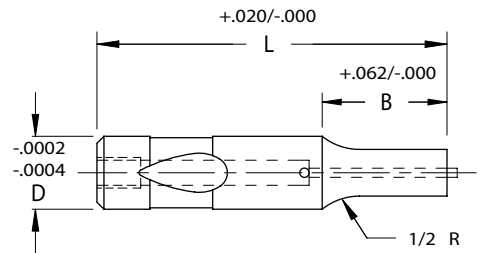
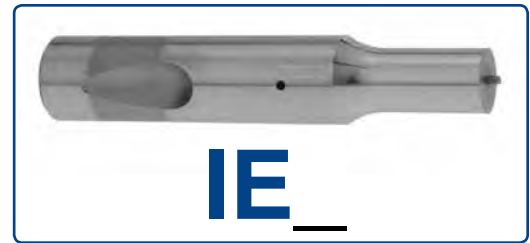
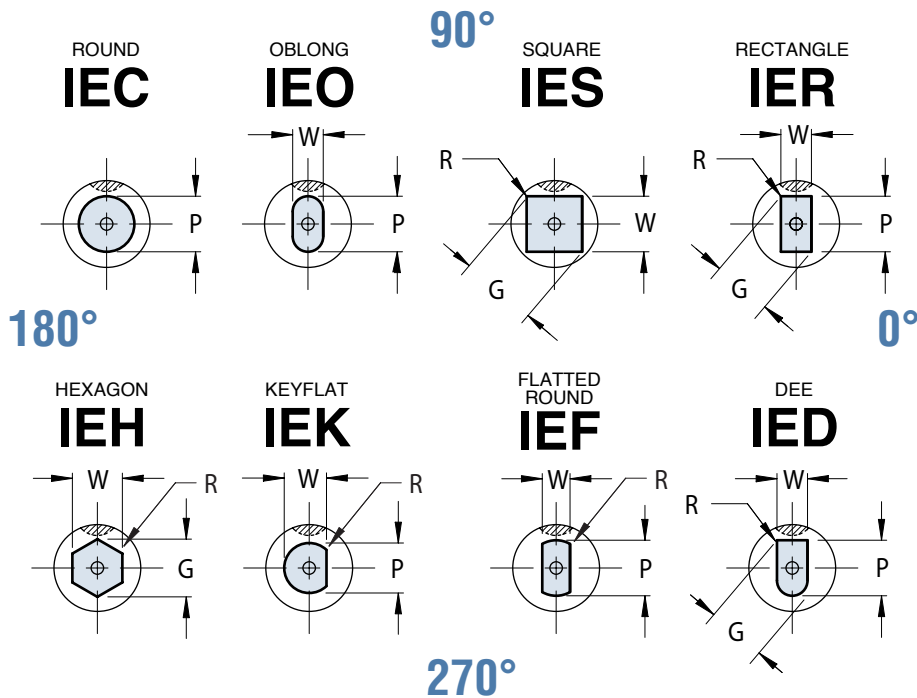
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK D	POINT LENGTH "B"				
		NAPMA STD	ALTERNATES			
			B MIN L=2.50	C MIN L=2.75	D MIN L=3.00	E MIN L=3.25
IH_37	.375	.62	.75	1.00		
IH_50	.500	.81	.75	1.00	1.25	
IH_62	.625	.94	.75	1.00	1.25	
IH_75	.750	1.06	.75	1.00	1.25	1.50
IH_87	.875	1.18	.75	1.00	1.25	1.50
IH_100	1.000	1.25	.75	1.00	1.25	1.50
IH_125	1.250	1.44	.75	1.00	1.25	1.50

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

BALL LOCK PUNCHES

HEAVY DUTY/EJECTOR



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK DIA D	ROUND RANGE P	SHAPE		OVERALL LENGTH "L"														
			MIN W	MAX G/P	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
IE_37	.375	.125-.374	.125	.375	X	X	X	X	X	X	X	X	X	X	X				
IE_50	.500	.187-.499	.187	.500	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IE_62	.625	.312-.624	.250	.625	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IE_75	.750	.437-.749	.312	.750	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IE_87	.875	.625-.874	.375	.875		X	X	X	X	X	X	X	X	X	X	X	X	X	X
IE_100	1.000	.750-.999	.437	1.000			X	X	X	X	X	X	X	X	X	X	X	X	X
IE_125	1.250	1.000-1.249	.500	1.250			X	X	X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\pm .0005$
- .0000

Shape P, W $\pm .0005$

	.0005	P to D
	.001	P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY:	QTY:	TYPE:	"D"	"L"	POINT LENGTH	P(OR P&W) DIMENSIONS	ALTERATION CODE
EXAMPLE:	5	IEC	62	3.00	.75	.552	X2 = 2.98
EXAMPLE:	7	IEO	87	4.50	1.25	.790 x .685	B/S @ 0

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK DIA D	NAPMA	POINT LENGTH "B"				EJECTOR SIZE
			STD	ALTERNATES			
IE_37	.375	.62	.75	1.00			IAE 4
IE_50	.500	.81	.75	1.00	1.25		IAE 6
IE_62	.625	.94	.75	1.00	1.25		IAE 6
IE_75	.750	1.06	.75	1.00	1.25	1.50	IAE 9
IE_87	.875	1.18	.75	1.00	1.25	1.50	IAE 9
IE_100	1.000	1.25	.75	1.00	1.25	1.50	IAE 9
IE_125	1.250	1.44	.75	1.00	1.25	1.50	IAE 9

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

BALL LOCK PILOTS

HEAVY DUTY

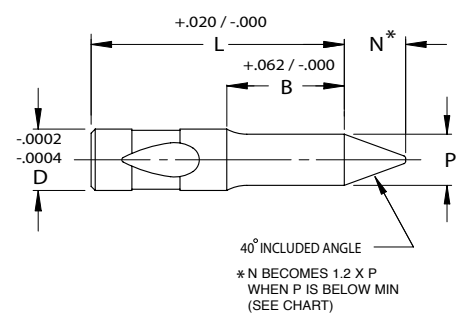
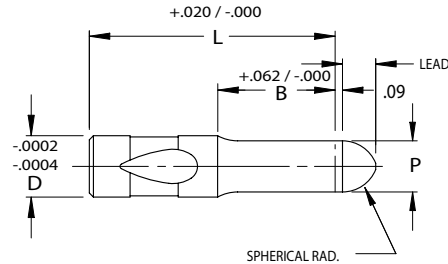
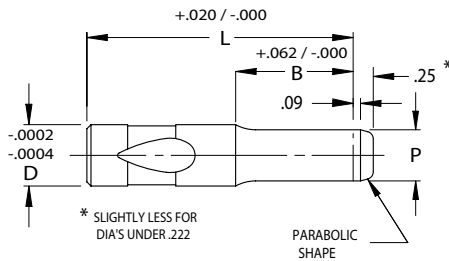
STANDARD STYLE



BULLET NOSE STYLE



LONG LEAD STYLE



P DIM	LEAD
.060-.374	5/32
.375-UP	13/32

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

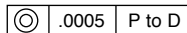
CATALOG TYPE	SHANK DIA D	RANGE P	LEAD N	P BELOW SEE NOTE*	LENGTH "L"												
					2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.50	6.00
IH_37	.375	.125-.375	.37	.262	X	X	X	X	X	X	X	X	X	X	X	X	
IH_50	.500	.187-.500	.50	.357	X	X	X	X	X	X	X	X	X	X	X	X	X
IH_62	.625	.312-.625	.62	.444	X	X	X	X	X	X	X	X	X	X	X	X	X
IH_75	.750	.437-.750	.75	.539	X	X	X	X	X	X	X	X	X	X	X	X	X
IH_87	.875	.625-.875	.87	.626		X	X	X	X	X	X	X	X	X	X	X	X
IH_100	1.000	.750-1.000	1.00	.721			X	X	X	X	X	X	X	X	X	X	X
IH_125	1.250	1.000-1.250	1.25	.903			X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P +.0005
-.0000



When P = D Shank Tolerances Apply

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE
EXAMPLE: 6 IHT 50 5.00 1.00 .435 X1 = 4.85
EXAMPLE: 2 IHA 87 4.50 .75 .770

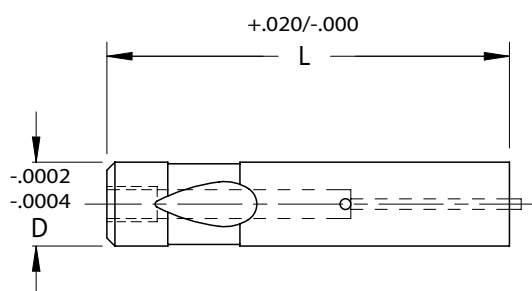
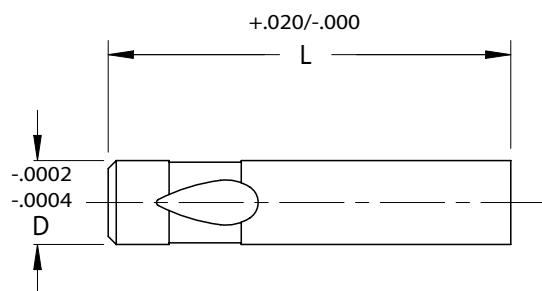
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK DIA D	POINT LENGTH "B"				
		NAPMA	ALTERNATES			
		STD	B MIN L=2.50	C MIN L=2.75	D MIN L=3.00	E MIN L=3.25
IH_37	.375	.62	.75	1.00		
IH_50	.500	.81	.75	1.00	1.25	
IH_62	.625	.94	.75	1.00	1.25	
IH_75	.750	1.06	.75	1.00	1.25	1.50
IH_87	.875	1.18	.75	1.00	1.25	1.50
IH_100	1.000	1.25	.75	1.00	1.25	1.50
IH_125	1.250	1.44	.75	1.00	1.25	1.50

BALL LOCK PUNCH BLANKS

MOELLER
PRECISION TOOL

HEAVY DUTY/SOLID/EJECTOR



Material

Steel: M2, HRC 60-63

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L"

EXAMPLE: 4 IHB 50 5.00

EXAMPLE: 6 IEB 87 4.50

Complete design & CAD files visit WWW.MOELLERMCAD.COM

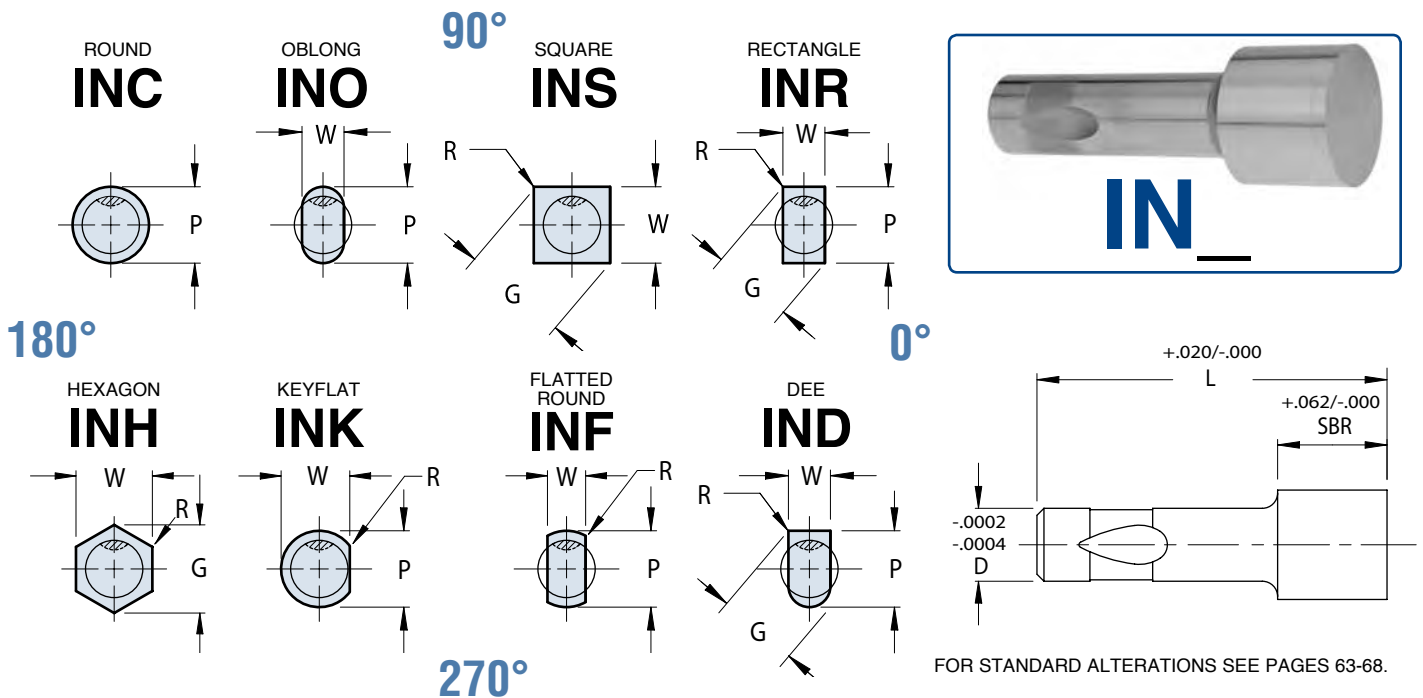
FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG NUMBER	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	5.50	6.00	7.00
SOLID															
IHB 37	.375	X	X	X	X	X	X	X	X	X	X	X	X	X	
IHB 50	.500	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IHB 62	.625	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IHB 75	.750	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IHB 87	.875		X	X	X	X	X	X	X	X	X	X	X	X	X
IHB 100	1.000			X	X	X	X	X	X	X	X	X	X	X	X
IHB 125	1.250			X	X	X	X	X	X	X	X	X	X	X	X

CATALOG NUMBER	SHANK DIA D	OVERALL LENGTH "L"															EJECTOR SIZE
		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																	
IEB 37	.375	X	X	X	X	X	X	X	X	X	X	X					IAE 4
IEB 50	.500	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
IEB 62	.625	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
IEB 75	.750	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
IEB 87	.875		X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
IEB 100	1.000			X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
IEB 125	1.250			X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9

NOSE LARGE PUNCHES

HEAVY DUTY/SOLID



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK DIA D	POINT LENGTH "SBR"	ROUND	SHAPE		OVERALL LENGTH "L"								
			RANGE P	MIN W	MAX G/P	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50
IN_37	.375	.62	.376-.750	.125	.750	X	X	X	X	X				
IN_50	.500	.75	.501-1.250	.188	1.250	X	X	X	X	X	X	X	X	X
IN_62	.625	.87	.626-1.250	.250	1.250	X	X	X	X	X	X	X	X	X
IN_75	.750	.94	.751-1.750	.312	1.750	X	X	X	X	X	X	X	X	X
IN_87	.875	.94	.876-1.750	.375	1.750	X	X	X	X	X	X	X	X	X
IN_100	1.000	.94	1.001-2.000	.437	2.000	X	X	X	X	X	X	X	X	X
IN_125	1.250	1.25	1.251-2.500	.500	2.500			X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $+0.0005$
 -0.0000

Shape P, W ± 0.0005

	.0005	P to D
	.001	P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSIONS P(OR P&W) ALTERATION CODE

EXAMPLE: 2 INC 50 4.00 .635 X1 = 3.85

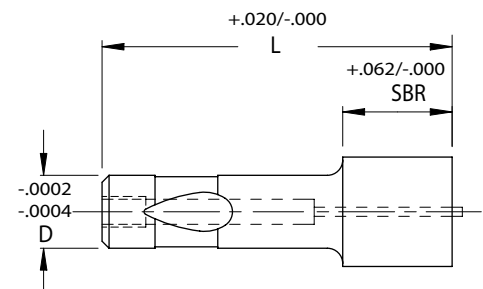
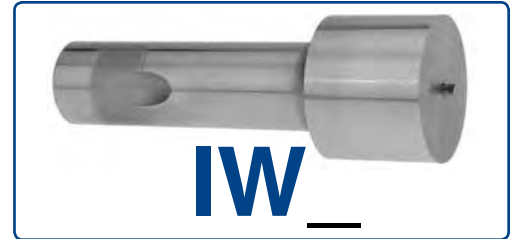
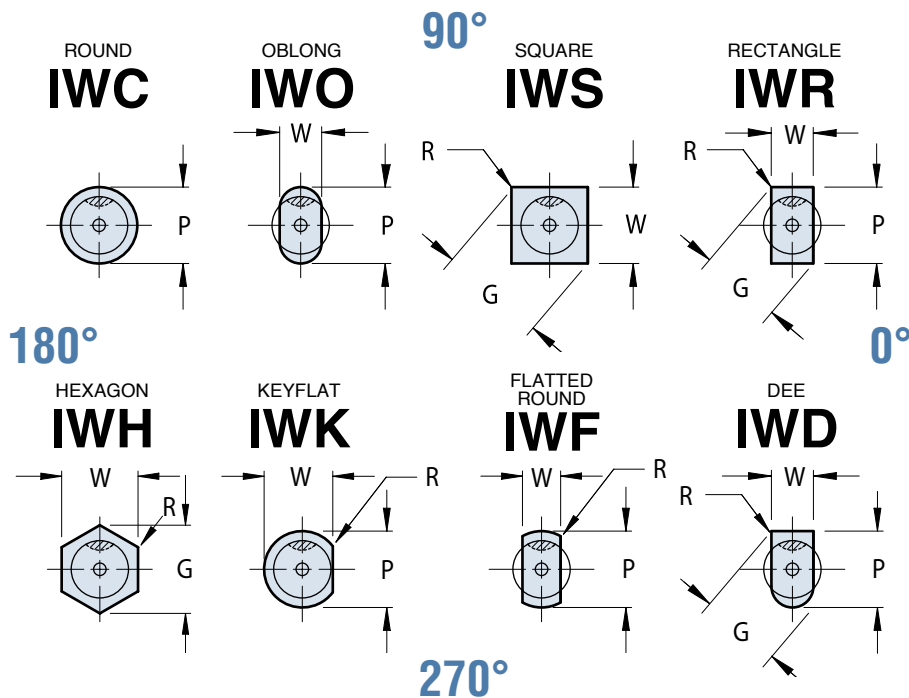
EXAMPLE: 5 INO 87 4.50 1.50 x .625

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

NOSE LARGE PUNCHES

HEAVY DUTY/EJECTOR



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK DIA D	POINT LENGTH “SBR”	ROUND	SHAPE		OVERALL LENGTH “L”										EJECTOR SIZE
			RANGE P	MIN W	MAX G/P	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50		
IW_ 37	.375	.62	.376-.750	.125	.750	X	X	X	X	X					IAE 4	
IW_ 50	.500	.75	.501-1.250	.188	1.250	X	X	X	X	X	X	X	X	X	IAE 6	
IW_ 62	.625	.87	.626-1.250	.250	1.250	X	X	X	X	X	X	X	X	X	IAE 6	
IW_ 75	.750	.94	.751-1.750	.312	1.750	X	X	X	X	X	X	X	X	X	IAE 9	
IW_ 87	.875	.94	.876-1.750	.375	1.750	X	X	X	X	X	X	X	X	X	IAE 9	
IW_ 100	1.000	.94	1.001-2.000	.437	2.000	X	X	X	X	X	X	X	X	X	IAE 9	
IW_ 125	1.250	1.25	1.251-2.500	.500	2.500			X	X	X	X	X	X	X	IAE 9	

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\pm .0005$
- .0000

Shape P, W $\pm .0005$

⊙	.0005	P to D
⊙	.001	P to D

ORDER EXAMPLE:

(Reference page 4)

P(OR P&W) ALTERATION
SPECIFY: QTY: TYPE "D" "L" DIMENSIONS CODE

EXAMPLE: 8 IWC 75 3.00 .935

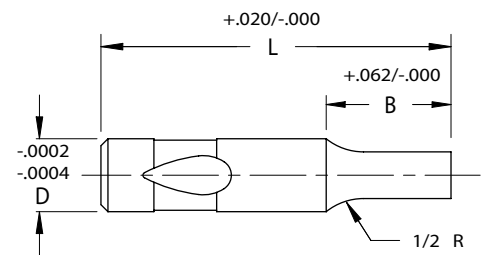
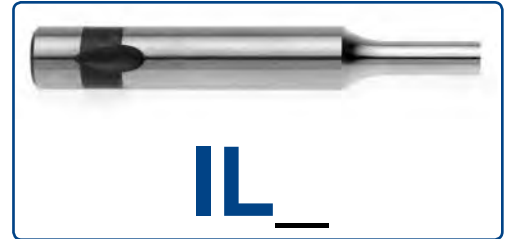
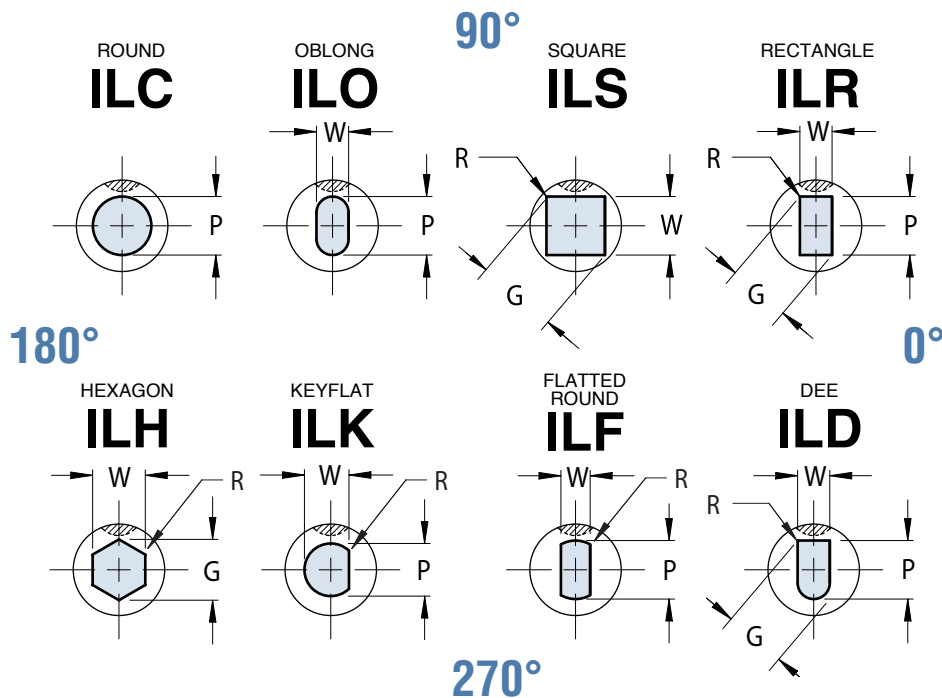
EXAMPLE: 3 IWR 50 4.50 .750 x .625 X1 = 4.35

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

BALL LOCK PUNCHES

LIGHT DUTY/SOLID



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCD.COM

CATALOG TYPE	SHANK DIA D	ROUND	SHAPE		OVERALL LENGTH "L"											
		RANGE P	MIN W	MAX G/P	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	5.00
IL_25	.250	.078-.249	.078	.250	X	X	X	X	X	X	X	X	X			
IL_37	.375	.125-.374	.125	.375	X	X	X	X	X	X	X	X	X	X	X	X
IL_50	.500	.187-.499	.187	.500	X	X	X	X	X	X	X	X	X	X	X	X
IL_62	.625	.312-.624	.250	.625	X	X	X	X	X	X	X	X	X	X	X	X
IL_75	.750	.437-.749	.312	.750		X	X	X	X	X	X	X	X	X	X	X
IL_87	.875	.625-.874	.375	.875		X	X	X	X	X	X	X	X	X	X	X
IL_100	1.000	.750-.999	.437	1.000		X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\pm .0005$
- .0000

Shape P, W $\pm .0005$

	.0005	P to D
	.001	P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE

EXAMPLE: 3 ILC 37 4.00 1.00 .325 S2 A=7

EXAMPLE: 7 ILR 87 4.50 .75 .710 x .605 R = .080 X2 = 4.450

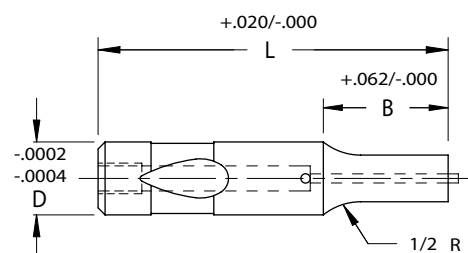
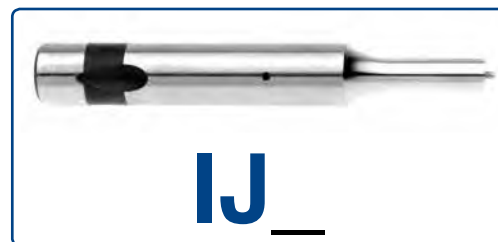
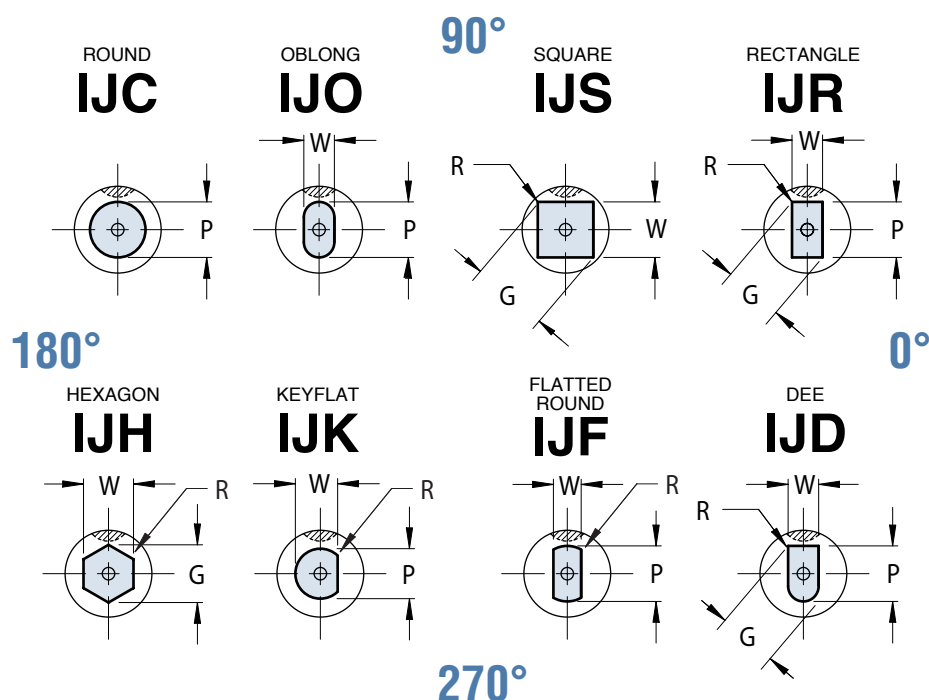
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK DIA D	POINT LENGTH "B"			
		NAPMA	ALTERNATES		
		STD	B MIN L=2.00	C MIN L=2.25	D MIN L=2.50
IL_25	.250	.50	.75		
IL_37	.375	.62	.75	1.00	
IL_50	.500	.75	.75	1.00	1.25
IL_62	.625	.87	.75	1.00	1.25
IL_75	.750	.94	.75	1.00	1.25
IL_87	.875	.94	.75	1.00	1.25
IL_100	1.000	.94	.75	1.00	1.25

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN.
AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

BALL LOCK PUNCHES

LIGHT DUTY/EJECTOR



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCD.COM

CATALOG TYPE	SHANK DIA D	ROUND	SHAPE		OVERALL LENGTH "L"								
		RANGE P	MIN W	MAX G/P	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
IJ_25	.250	.078-.249	.078	.250	X	X	X	X	X	X	X		
IJ_37	.375	.125-.374	.125	.375	X	X	X	X	X	X	X	X	X
IJ_50	.500	.187-.499	.187	.500	X	X	X	X	X	X	X	X	X
IJ_62	.625	.312-.624	.250	.625	X	X	X	X	X	X	X	X	X
IJ_75	.750	.437-.749	.312	.750		X	X	X	X	X	X	X	X
IJ_87	.875	.625-.874	.375	.875		X	X	X	X	X	X	X	X
IJ_100	1.000	.750-.999	.437	1.000		X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\pm .0005$

Shape P, W $\pm .0005$

	.0005	P to D
	.001	P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE
 EXAMPLE: 9 IJC 50 4.00 1.00 .435 X1 = 3.85
 EXAMPLE: 6 IJO 87 3.50 .75 .750 x .625 S3 A = 5

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK DIA D	POINT LENGTH "B"				EJECTOR SIZE
		NAPMA	ALTERNATES			
		STD	B MIN L=2.00	C MIN L=2.25	D MIN L=2.50	
IJ_25	.250	.50	.75			IAE 3
IJ_37	.375	.62	.75	1.00		IAE 4
IJ_50	.500	.75	.75	1.00	1.25	IAE 6
IJ_62	.625	.87	.75	1.00	1.25	IAE6
IJ_75	.750	.94	.75	1.00	1.25	IAE 9
IJ_87	.875	.94	.75	1.00	1.25	IAE 9
IJ_100	1.000	.94	.75	1.00	1.25	IAE 9

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

BALL LOCK PILOTS

LIGHT DUTY

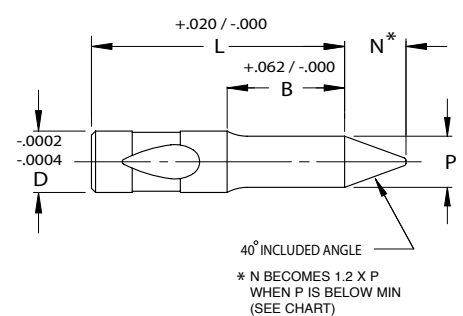
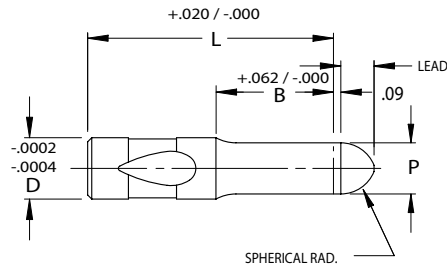
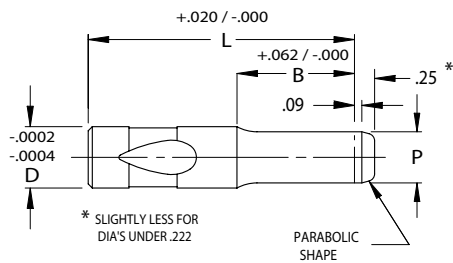
STANDARD STYLE



BULLET NOSE STYLE



LONG LEAD STYLE



P DIM	LEAD
.060-.374	5/32
.375-UP	13/32

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK DIA D	RANGE P	LEAD N	P BELOW SEE NOTE*	LENGTH "L"											
					2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	5.00
IL_25	.250	.078-.250	.25	.175	X	X	X	X	X	X	X	X	X			
IL_37	.375	.125-.375	.37	.262	X	X	X	X	X	X	X	X	X	X	X	X
IL_50	.500	.187-.500	.50	.357	X	X	X	X	X	X	X	X	X	X	X	X
IL_62	.625	.312-.625	.62	.444	X	X	X	X	X	X	X	X	X	X	X	X
IL_75	.750	.437-.750	.75	.539		X	X	X	X	X	X	X	X	X	X	X
IL_87	.875	.625-.875	.87	.626		X	X	X	X	X	X	X	X	X	X	X
IL_100	1.000	.750-1.000	1.00	.721		X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\begin{matrix} +.0005 \\ -.0000 \end{matrix}$ Ⓢ .0005 P to D

When P = D Shank Tolerances Apply

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE
 EXAMPLE: 4 ILT 50 5.00 1.00 .435 X1 = 4.85
 EXAMPLE: 2 ILA 87 4.50 .75 .770

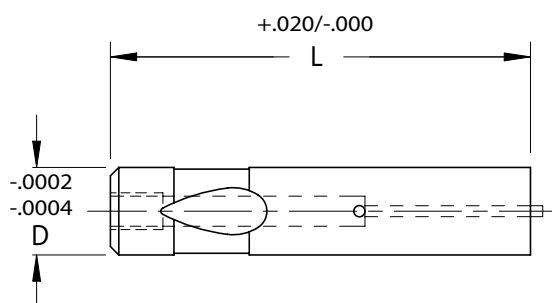
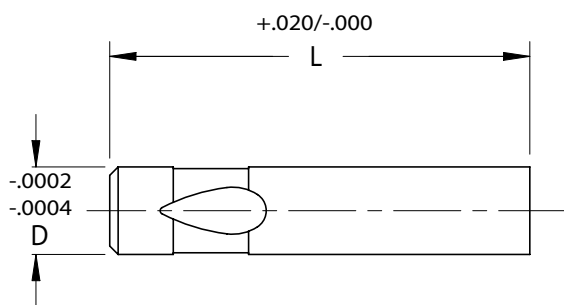
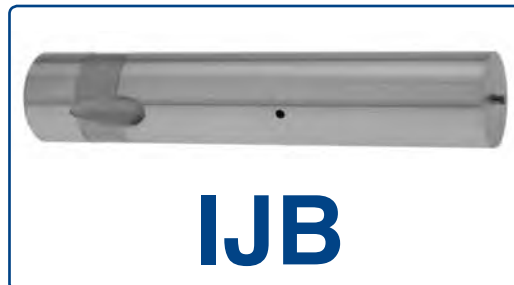
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK DIA D	POINT LENGTH "B"			
		NAPMA	ALTERNATES		
		STD	B MIN L=2.00	C MIN L=2.25	D MIN L=2.50
IL_25	.250	.50	.75		
IL_37	.375	.62	.75	1.00	
IL_50	.500	.75	.75	1.00	1.25
IL_62	.625	.87	.75	1.00	1.25
IL_75	.750	.94	.75	1.00	1.25
IL_87	.875	.94	.75	1.00	1.25
IL_100	1.000	.94	.75	1.00	1.25

BALL LOCK PUNCH BLANKS

MOELLER
PRECISION TOOL

LIGHT DUTY/SOLID/EJECTOR



Material
Steel: M2, HRC 60-63

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L"

EXAMPLE: 2 ILB 50 5.00

EXAMPLE: 6 IJB 87 3.50

Complete design & CAD files visit WWW.MOELLERMCAD.COM

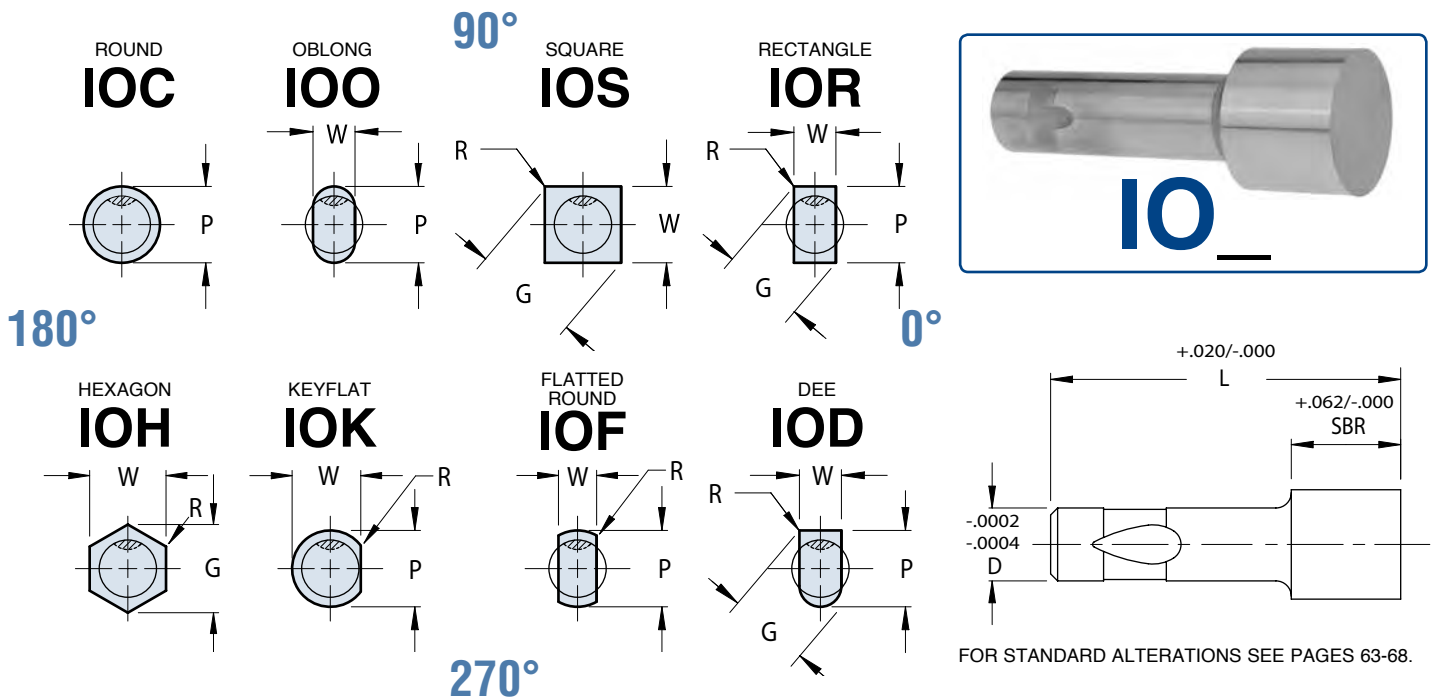
FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG NUMBER SOLID	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	5.00	5.50	6.00
ILB 25	.250	X	X	X	X	X	X	X	X	X	X				
ILB 37	.375	X	X	X	X	X	X	X	X	X	X	X	X	X	
ILB 50	.500	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ILB 62	.625	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ILB 75	.750		X	X	X	X	X	X	X	X	X	X	X	X	X
ILB 87	.875		X	X	X	X	X	X	X	X	X	X	X	X	X
ILB 100	1.000		X	X	X	X	X	X	X	X	X	X	X	X	X
ILB 125	1.250			X		X		X		X					

CATALOG NUMBER EJECTOR	SHANK DIA D	OVERALL LENGTH "L"									
		2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	EJECTOR SIZE
IJB 25	.250	X	X	X	X	X	X	X			IAE 3
IJB 37	.375	X	X	X	X	X	X	X	X	X	IAE 4
IJB 50	.500	X	X	X	X	X	X	X	X	X	IAE 6
IJB 62	.625	X	X	X	X	X	X	X	X	X	IAE 6
IJB 75	.750		X	X	X	X	X	X	X	X	IAE 9
IJB 87	.875		X	X	X	X	X	X	X	X	IAE 9
IJB 100	1.000		X	X	X	X	X	X	X	X	IAE 9

NOSE LARGE PUNCHES

LIGHT DUTY/SOLID



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK DIA D	POINT LENGTH "SBR"	ROUND	SHAPE		OVERALL LENGTH "L"								
			RANGE P	MIN W	MAX G/P	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50
IO_ 37	.375	.62	.376-.750	.125	.750	X	X	X	X	X				
IO_ 50	.500	.75	.501-1.250	.188	1.250	X	X	X	X	X	X	X	X	X
IO_ 62	.625	.87	.626-1.250	.250	1.250	X	X	X	X	X	X	X	X	X
IO_ 75	.750	.94	.751-1.750	.312	1.750	X	X	X	X	X	X	X	X	X
IO_ 87	.875	.94	.876-1.750	.375	1.750	X	X	X	X	X	X	X	X	X
IO_ 100	1.000	.94	1.001-2.000	.437	2.000	X	X	X	X	X	X	X	X	X
IO_ 125	1.250	1.25	1.251-2.500	.500	2.500			X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\pm .0005$
- .0000



.0005

P to D

Shape P, W $\pm .0005$



.001

P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSIONS P(OR P&W) ALTERATION CODE

EXAMPLE: 5 IOC 50 4.00 .635 X1 = 3.85

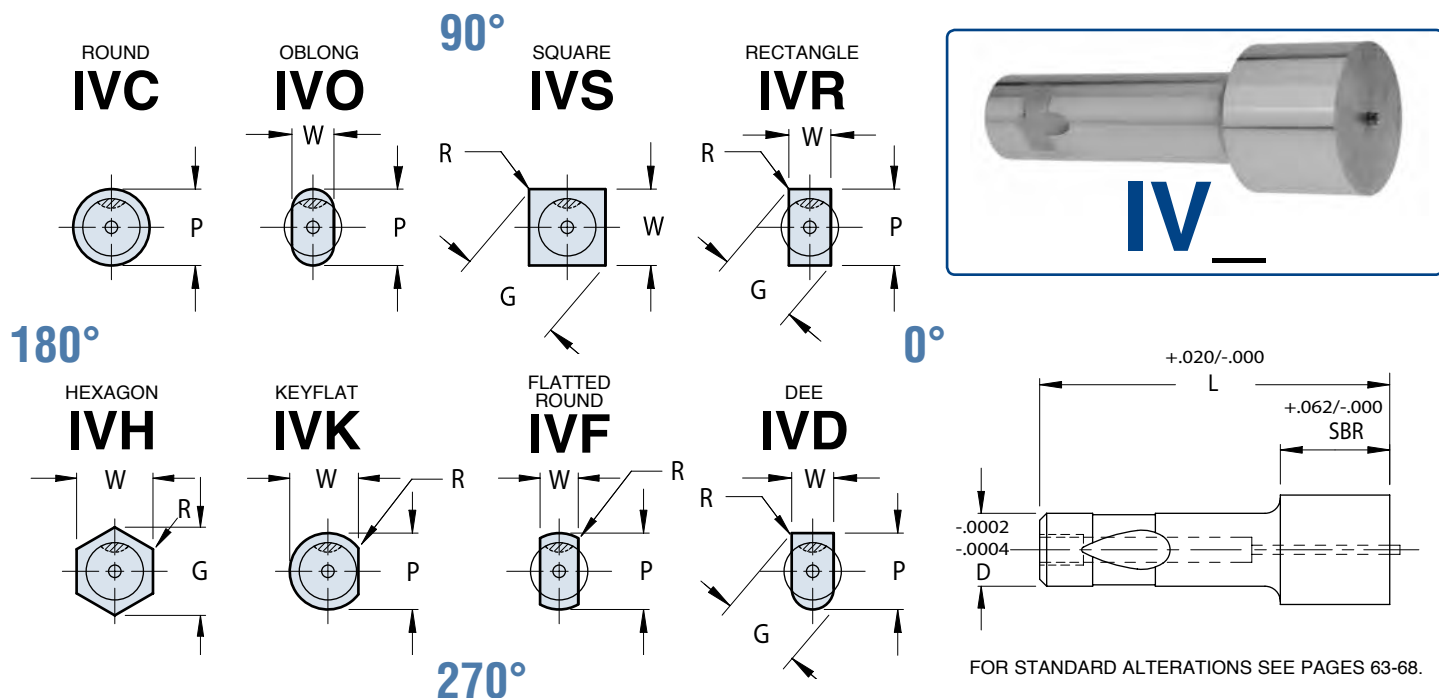
EXAMPLE: 8 IOS 87 4.50 .944 R = .050 B/S @ 30

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

NOSE LARGE PUNCHES

LIGHT DUTY/EJECTOR



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

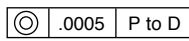
CATALOG TYPE	SHANK DIA D	POINT LENGTH "SBR"	ROUND	SHAPE		OVERALL LENGTH "L"									EJECTOR SIZE
			RANGE P	MIN W	MAX G/P	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	
IV_ 37	.375	.62	.376-.750	.125	.750	X	X	X	X	X					IAE 4
IV_ 50	.500	.75	.501-1.250	.188	1.250	X	X	X	X	X	X	X	X	X	IAE 6
IV_ 62	.625	.87	.626-1.250	.250	1.250	X	X	X	X	X	X	X	X	X	IAE 6
IV_ 75	.750	.94	.751-1.750	.312	1.750	X	X	X	X	X	X	X	X	X	IAE 9
IV_ 87	.875	.94	.876-1.750	.375	1.750	X	X	X	X	X	X	X	X	X	IAE 9
IV_ 100	1.000	.94	1.001-2.000	.437	2.000	X	X	X	X	X	X	X	X	X	IAE 9
IV_ 125	1.250	1.25	1.251-2.500	.500	2.500			X	X	X	X	X	X	X	IAE 9

Material

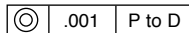
Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\pm .0005$
- .0000



Shape P, W $\pm .0005$



ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSIONS P(OR P&W) ALTERATION CODE

EXAMPLE: 8 IVC 37 3.50 .435 X1 = 3.35

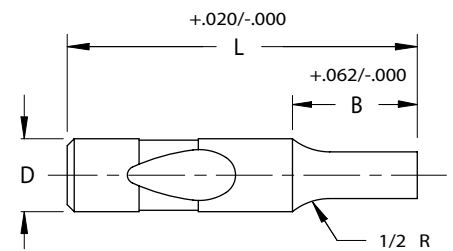
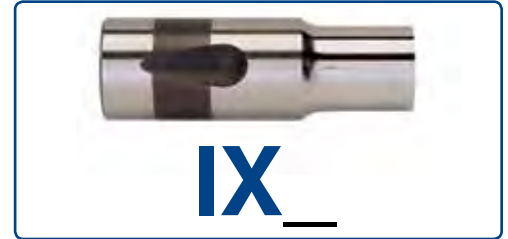
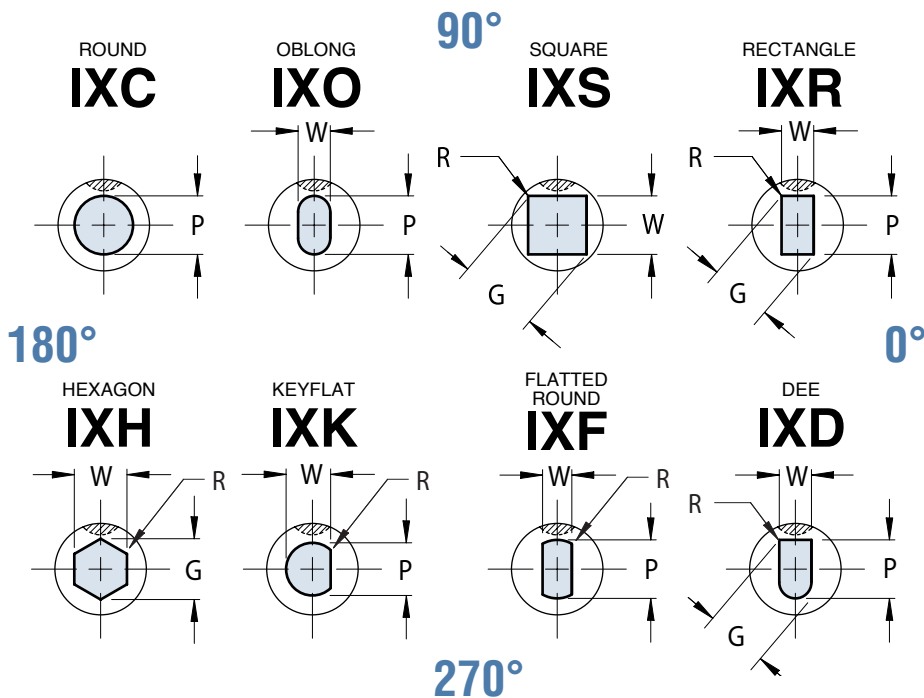
EXAMPLE: 4 IVS 75 4.50 .840 R = .050 B/S @ 75

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

BALL LOCK PUNCHES

EXTRA HEAVY DUTY/SOLID



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK DIA D	SHANK TOLERANCE	POINT LENGTH "B"	ROUND	SHAPE		OVERALL LENGTH "L"		
				RANGE P	MIN W	MAX G/P	4.50	5.00	5.50
IX_100	1.000	-.0003/-0.0006	1.31	.625-.999	.437	1.000	X	X	X
IX_125	1.250	-.0004/-0.0007	1.62	.875-1.249	.500	1.250	X	X	X
IX_150	1.500	-.0005/-0.0008	1.62	1.125-1.499	.625	1.500	X	X	X
IX_175	1.750	-.0006/-0.0009	1.62	1.375-1.749	.750	1.750	X	X	X
IX_200	2.000	-.0007/-0.0010	1.62	1.625-1.999	.875	2.000		X	X
IX_225	2.250	-.0007/-0.0010	1.87	1.875-2.249	1.000	2.250		X	X
IX_250	2.500	-.0007/-0.0010	1.87	2.125-2.499	1.125	2.500		X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P +.0005
-.0000

⊙ .0005 P to D

Shape P, W ± .0005

⊙ .001 P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSIONS P(OR P&W) ALTERATION CODE

EXAMPLE: 3 IXC 1.500 5.00 1.403 X1 = 4.90

EXAMPLE: 6 IXO 2.000 4.50 1.837 X 1.340 B/S @ 0

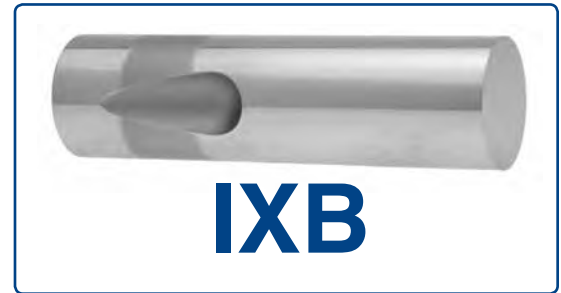
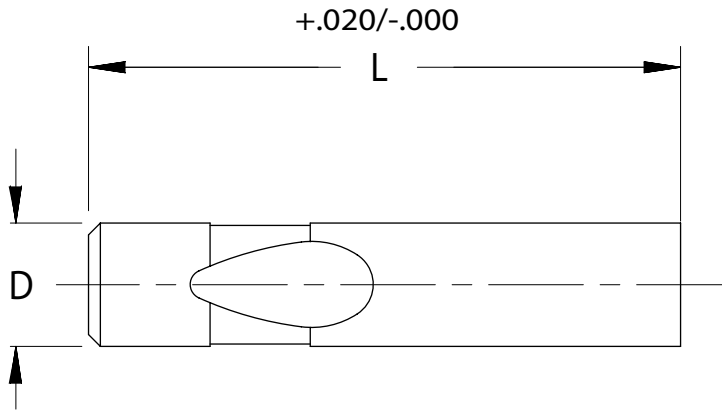
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME PRICE.

BALL LOCK PUNCH BLANKS

EXTRA HEAVY DUTY

MOELLER
PRECISION TOOL



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	SHANK DIA. D	SHANK TOLERANCE	OVERALL LENGTH "L"		
			4.50	5.00	5.50
IXB 100	1.00	-.0003/-0.0006	X	X	X
IXB 125	1.250	-.0004/-0.0007	X	X	X
IXB 150	1.500	-.0005/-0.0008	X	X	X
IXB 175	1.750	-.0006/-0.0009	X	X	X
IXB 200	2.000	-.0007/-0.0010		X	X
IXB 225	2.250	-.0007/-0.0010		X	X
IXB 250	2.500	-.0007/-0.0010		X	X

Material

Steel: M2, HRC 60-63

ORDER EXAMPLE:

(Reference page 4)

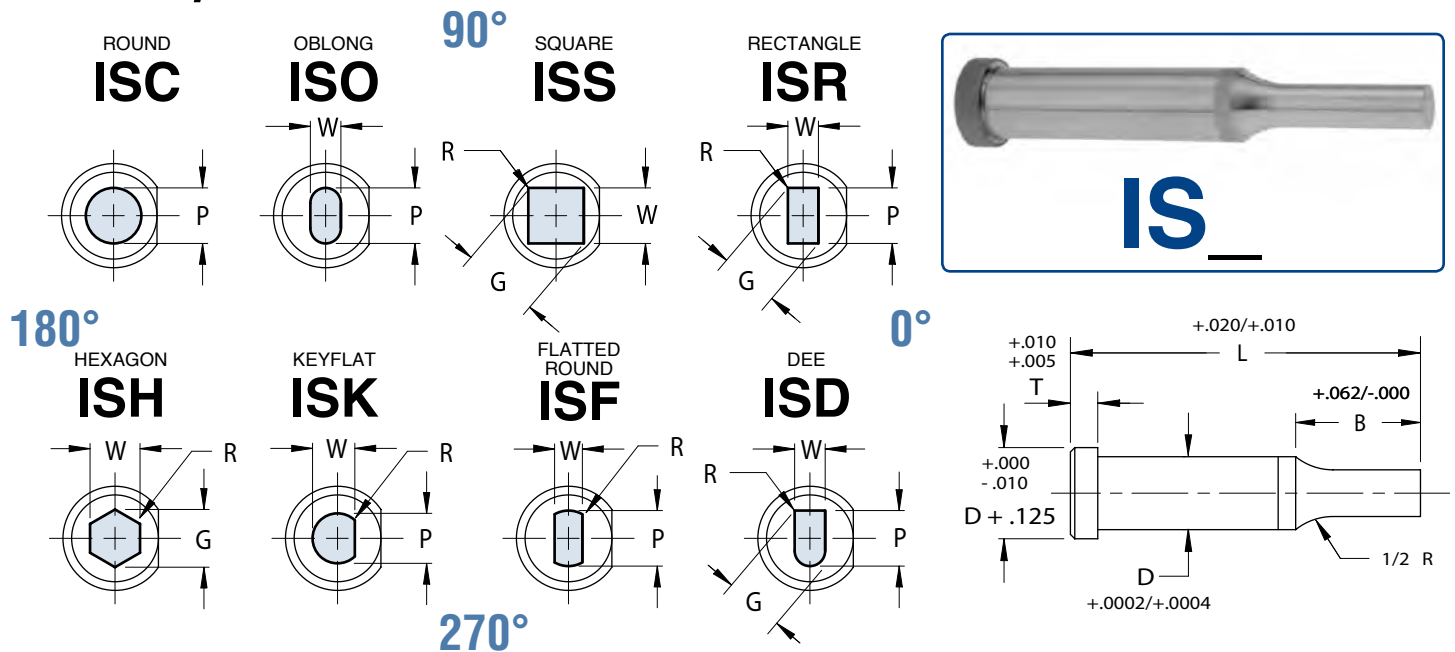
SPECIFY: QTY: TYPE "D" "L" ALTERATION

EXAMPLE: 3 IXB 1.500 5.00 X1 = 4.90

EXAMPLE: 6 IXB 2.000 4.50

SHOULDER PUNCHES

BASIC/SOLID



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK D	ROUND	SHAPE		OVERALL LENGTH "L"																	
		RANGE P	MIN W	MAX G/P	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	5.50	6.00	7.00
IS_18	.1875	.062-.1874	.062	.1875	X	X	X	X	X	X	X	X	X	X								
IS_25	.2500	.078-.2499	.078	.2500	X	X	X	X	X	X	X	X	X	X	X							
IS_31	.3125	.093-.3124	.093	.3125	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
IS_37	.3750	.125-.3749	.125	.3750		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_43	.4375	.187-.4374	.187	.4375		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_50	.5000	.250-.4999	.187	.5000			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_62	.6250	.375-.6249	.250	.6250			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_75	.7500	.500-.7499	.312	.7500				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_87	.8750	.562-.8749	.312	.8750					X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_100	1.0000	.687-.9999	.375	1.0000					X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_125	1.2500	.937-1.2499	.500	1.2500							X	X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63
Heads HRC 45-55

Standard Point Tolerance

Round P $\begin{smallmatrix} +.0005 \\ -.0000 \end{smallmatrix}$

Shape P, W $\pm .0005$

	.0005	P to D
	.001	P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE

EXAMPLE: 4 ISC 50 5.00 1.00 .435 X1 = 4.85

EXAMPLE: 8 ISO 87 4.50 .75 .750 x .625 F1 @ 45

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

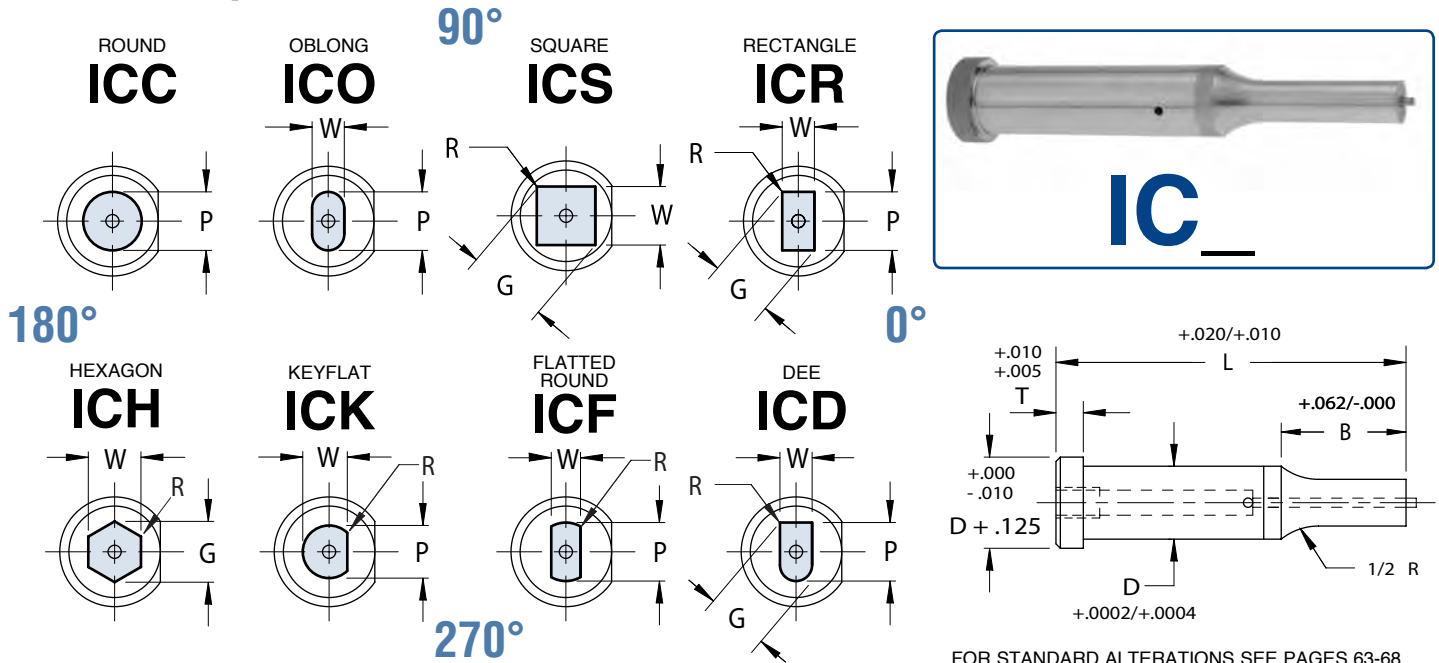
CATALOG TYPE	SHANK D	HEAD DIM T	POINT LENGTH "B"				
			NAPMA STD	ALTERNATES			
				B MIN L=1.75	C MIN L=2.00	D MIN L=2.25	E MIN L=2.50
IS_18	.1875	.125	.44	.75	1.00		
IS_25	.2500	.125	.50	.75	1.00		
IS_31	.3125	.125	.56	.75	1.00	1.25	1.50
IS_37	.3750	.188	.62	.75	1.00	1.25	1.50
IS_43	.4375	.188	.75	.75	1.00	1.25	1.50
IS_50	.5000	.188	.81	.75	1.00	1.25	1.50
IS_62	.6250	.250	.93	.75	1.00	1.25	1.50
IS_75	.7500	.250	1.06	.75	1.00	1.25	1.50
IS_87	.8750	.250	1.12	.75	1.00	1.25	1.50
IS_100	1.000	.250	1.25	.75	1.00	1.25	1.50
IS_125	1.2500	.250	1.50	.75	1.00	1.25	1.50

STANDARD FLAT LOCATION IS AT 0° AS SHOWN.

AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

SHOULDER PUNCHES

BASIC/EJECTOR



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

Complete design & CAD files visit WWW.MOELLERMCD.COM

CATALOG TYPE	SHANK D	ROUND	SHAPE		OVERALL LENGTH “L”																		
		RANGE P	MIN W	MAX G/P	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
IC_ 18	.1875	.062-.1874	.062	.1875	X	X	X	X	X	X	X	X	X	X									
IC_ 25	.2500	.078-.2499	.078	.2500	X	X	X	X	X	X	X	X	X	X									
IC_ 31	.3125	.125-.3124	.125	.3125	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 37	.3750	.187-.3749	.187	.3750		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 43	.4375	.187-.4374	.187	.4375		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 50	.5000	.250-.4999	.187	.5000			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 62	.6250	.375-.6249	.250	.6250			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 75	.7500	.500-.7499	.312	.7500				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 87	.8750	.562-.8749	.312	.8750					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 100	1.0000	.687-.9999	.375	1.0000					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC_ 125	1.2500	.937-1.2499	.500	1.2500							X	X	X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63
Heads HRC 45-55

Standard Point Tolerance

Round P $\pm .0005$
- .0000

Shape P, W $\pm .0005$

⊙ .0005 P to D

⊙ .001 P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) ALTERATION CODE

EXAMPLE: 5 ICC 62 3.00 .75 .552 X2 = 2.98
EXAMPLE: 7 ICO 87 4.50 1.25 .790 x .685 F6 F = .390

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK D	HEAD DIM T	POINT LENGTH "B"					EJECTOR SIZE
			NAPMA STD	ALTERNATES				
				B MIN L=1.75	C MIN L=2.00	D MIN L=2.25	E MIN L=2.50	
IC_18	.1875	.125	.43	.75	1.00			IAE 2
IC_25	.2500	.125	.50	.75	1.00			IAE 3
IC_31	.3125	.125	.56	.75	1.00	1.25	1.50	IAE 4
IC_37	.3750	.188	.62	.75	1.00	1.25	1.50	IAE 6
IC_43	.4375	.188	.75	.75	1.00	1.25	1.50	IAE 6
IC_50	.5000	.188	.81	.75	1.00	1.25	1.50	IAE 6
IC_62	.6250	.250	.94	.75	1.00	1.25	1.50	IAE 9
IC_75	.7500	.250	1.06	.75	1.00	1.25	1.50	IAE 9
IC_87	.8750	.250	1.12	.75	1.00	1.25	1.50	IAE 9
IC_100	1.0000	.250	1.25	.75	1.00	1.25	1.50	IAE 9
IC_125	1.2500	.250	1.50	.75	1.00	1.25	1.50	IAE 9

STANDARD FLAT LOCATION IS AT 0° AS SHOWN. AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

SHOULDER PILOTS

BASIC/PILOT

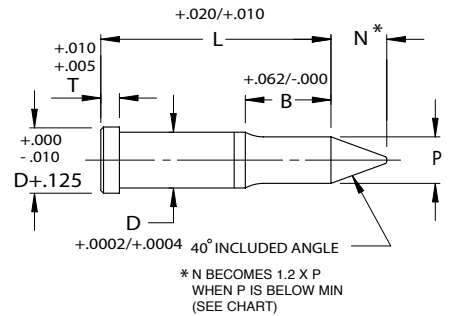
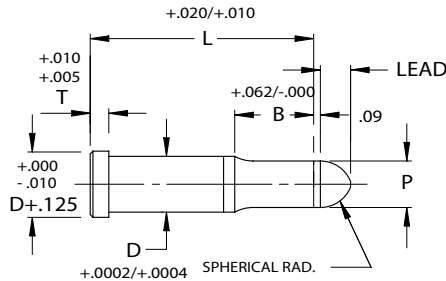
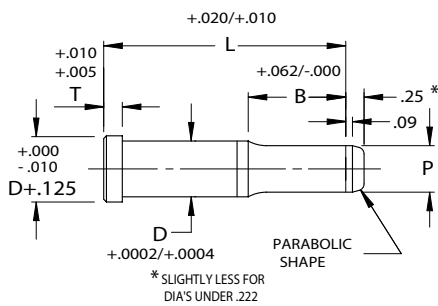
STANDARD STYLE



BULLET NOSE STYLE



LONG LEAD STYLE



P DIM	LEAD
.062-.374	5/32
.375-UP	13/32

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

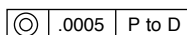
CATALOG TYPE	SHANK DIA D	POINT RANGE P	N	P BELOW SEE NOTE*	LENGTH "L"																
					1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.50	6.00
IS_18	.1875	.062-.1875	.18	.124	X	X	X	X	X	X	X	X	X	X							
IS_25	.2500	.078-.2500	.25	.175	X	X	X	X	X	X	X	X	X	X	X						
IS_31	.3125	.093-.3125	.31	.219	X	X	X	X	X	X	X	X	X	X	X	X	X				
IS_37	.3750	.125-.3750	.37	.262		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_43	.4375	.187-.4375	.43	.306		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_50	.5000	.250-.5000	.50	.357			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_62	.6250	.375-.6250	.62	.444			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_75	.7500	.500-.7500	.75	.539				X	X	X	X	X	X	X	X	X	X	X	X	X	X
IS_87	.8750	.562-.8750	.87	.630					X	X	X	X	X	X	X	X	X	X	X	X	X
IS_100	1.0000	.687-1.0000	1.00	.721					X	X	X	X	X	X	X	X	X	X	X	X	X
IS_125	1.2500	.937-1.2500	1.25	.903							X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63
Heads HRC 45-55

Standard Point Tolerance

Round P +.0005
-.0000



ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P DIMENSION ALTERATION CODE
EXAMPLE: 6 IST 50 5.00 1.00 .435 X1 = 4.85
EXAMPLE: 2 ISA 87 4.50 .75 .770

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

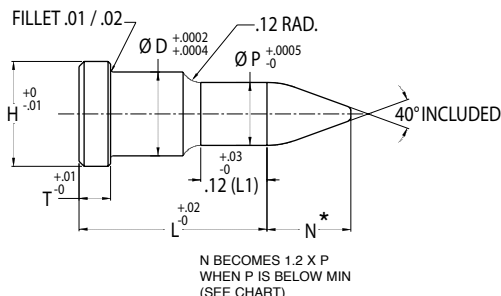
CATALOG TYPE	SHANK DIA D	HEAD THICK T	POINT LENGTH "B"			
			NAPMA STD	ALTERNATES		
				B MIN L=1.75	C MIN L=2.00	D MIN L=2.25
				E MIN L=2.50		
IS_18	.1875	.125	.44	.75	1.00	
IS_25	.2500	.125	.50	.75	1.00	
IS_31	.3125	.125	.56	.75	1.00	1.25
IS_37	.3750	.188	.62	.75	1.00	1.25
IS_43	.4375	.188	.75	.75	1.00	1.25
IS_50	.5000	.188	.81	.75	1.00	1.25
IS_62	.6250	.250	.94	.75	1.00	1.25
IS_75	.7500	.250	1.06	.75	1.00	1.25
IS_87	.8750	.250	1.12	.75	1.00	1.25
IS_100	1.0000	.250	1.25	.75	1.00	1.25
IS_125	1.2500	.250	1.50	.75	1.00	1.25

SHOULDER PILOTS

MOELLER
PRECISION TOOL

BASIC/COMPACT PILOT

POINTED STYLE



Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P +.0005
-.0000

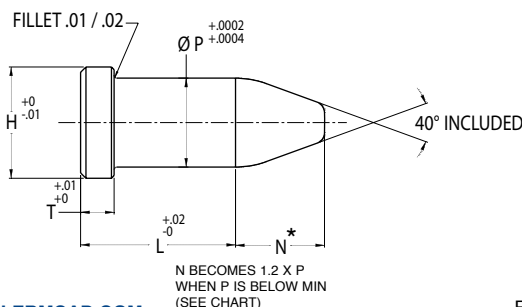
⊙ .0005 P to D

Complete design & CAD files visit WWW.MOELLERMCD.COM

FOR STANDARD ALTERATIONS SEE PAGES 59-64.

CATALOG TYPE POINTED	SHANK DIA D RANGE	DIA P RANGE	LEAD N	P BELOW SEE NOTE*	T	H	LENGTH "L"						
							0.625	0.750	0.875	1.000	1.125	1.250	1.375
ISW 25	0.2500	.1400 - .2499	0.25	.175	0.125	0.375	X	X	X	X	X	X	X
ISW 31	0.3125	.1840 - .3124	0.31	.219	0.125	0.438	X	X	X	X	X	X	X
ISW 37	0.3750	.2280 - .3749	0.37	.262	0.188	0.500	X	X	X	X	X	X	X
ISW 43	0.4375	.2620 - .4374	0.43	.306	0.188	0.562	X	X	X	X	X	X	X
ISW 50	0.5000	.2700 - .4999	0.50	.357	0.188	0.625	X	X	X	X	X	X	X
ISW 62	0.6250	.4050 - .6249	0.62	.444	0.250	0.750		X	X	X	X	X	X
ISW 75	0.7500	.5040 - .7499	0.75	.539	0.250	0.875		X	X	X	X	X	X
ISW 87	0.8750	.5920 - .8749	0.87	.630	0.250	1.000		X	X	X	X	X	X
ISW 100	1.0000	.6860 - .9999	1.00	.721	0.250	1.125		X	X	X	X	X	X

STRAIGHT STYLE



Material

Steel: M2, HRC 60-63

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSION P ALTERATION
CODE
EXAMPLE: 3 ISW 50 1.00 .435 X1 = .900
EXAMPLE: 5 ISV 1.25 .590 X4 = .175

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

Complete design & CAD files visit WWW.MOELLERMCD.COM

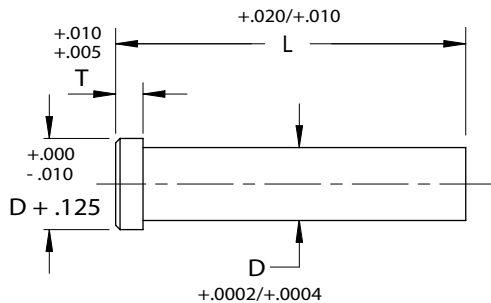
FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG TYPE STRAIGHT	SHANK DIA P RANGE	LEAD N	P BELOW SEE NOTE*	T	H	LENGTH "L"						
						0.625	0.750	0.875	1.000	1.125	1.250	1.375
ISV 25	.1876 - .2500	0.25	.175	0.125	0.375	X	X	X	X	X	X	X
ISV 31	.2501 - .3125	0.31	.219	0.125	0.438	X	X	X	X	X	X	X
ISV 37	.3126 - .3750	0.37	.262	0.188	0.500	X	X	X	X	X	X	X
ISV 43	.3751 - .4375	0.43	.306	0.188	0.562	X	X	X	X	X	X	X
ISV 50	.4376 - .5000	0.50	.357	0.188	0.625	X	X	X	X	X	X	X
ISV 62	.5001 - .6250	0.62	.444	0.250	0.750		X	X	X	X	X	X
ISV 75	.6251 - .7500	0.75	.539	0.250	0.875		X	X	X	X	X	X
ISV 87	.7501 - .8750	0.87	.630	0.250	1.000		X	X	X	X	X	X
ISV 100	.8751 - 1.000	1.00	.721	0.250	1.125		X	X	X	X	X	X

SHOULDER PUNCH BLANKS

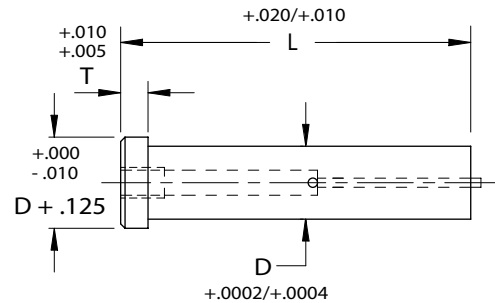
MOELLER
PRECISION TOOL

BASIC/SOLID/EJECTOR



Material

Steel: M2, HRC 60-63
Heads HRC 45-55



ORDER EXAMPLE: (Reference page 4)

SPECIFY: QTY: TYPE "D" "L"
EXAMPLE: 4 ISB 50 5.00
EXAMPLE: 6 ICB 87 4.50

Complete design & CAD files visit WWW.MOELLERMCAD.COM

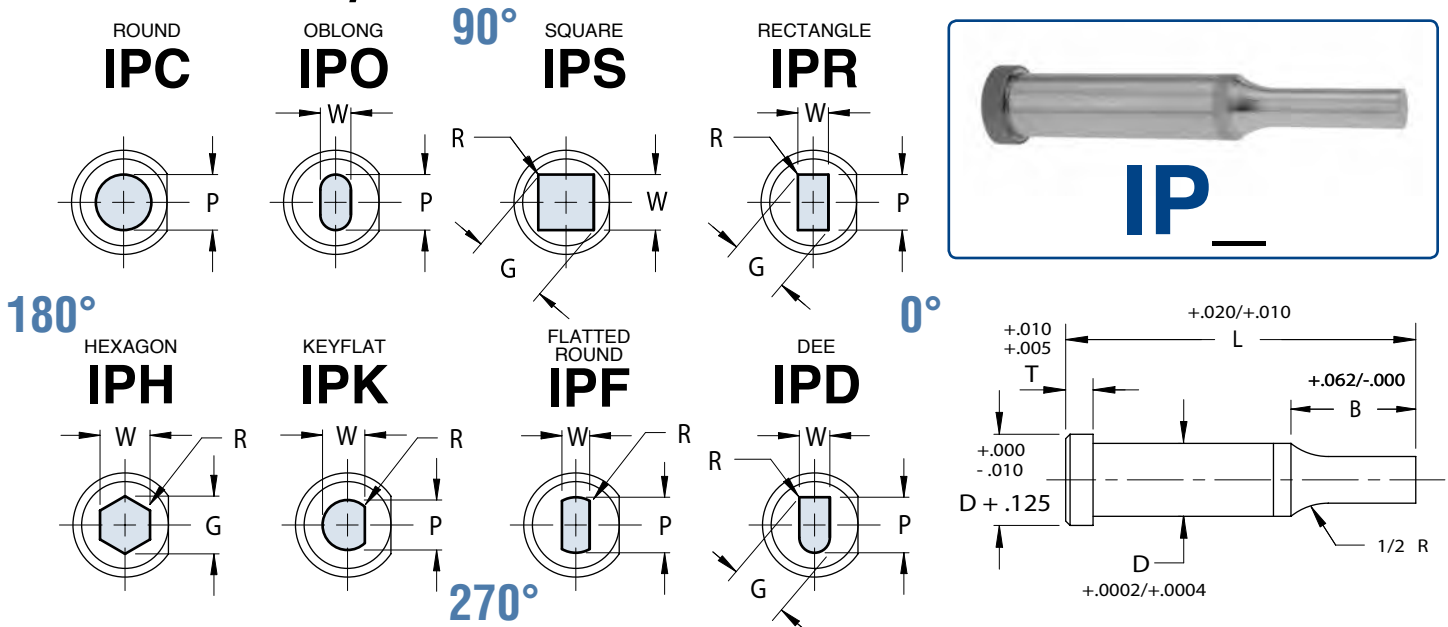
FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG NUMBER	SHANK DIA D	HEAD DIM T	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	4.25	4.50	4.75	5.00	5.50	6.00	7.00
ISB 12	.1250	.125	X	X	X	X	X	X	X	X										
ISB 18	.1875	.125	X	X	X	X	X	X	X	X	X	X	X							
ISB 25	.2500	.125	X	X	X	X	X	X	X	X	X	X	X	X						
ISB 31	.3125	.125	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
ISB 37	.3750	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ISB 43	.4375	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ISB 50	.5000	.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ISB 62	.6250	.250			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ISB 75	.7500	.250				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ISB 87	.8750	.250					X	X	X	X	X	X	X	X	X	X	X	X	X	X
ISB 100	1.0000	.250					X	X	X	X	X	X	X	X	X	X	X	X	X	X
ISB 125	1.2500	.250							X	X	X	X	X	X	X	X	X	X	X	X

CATALOG NUMBER	SHANK DIA D	HEAD DIM T	OVERALL LENGTH "L"																		EJECTOR SIZE
			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
ICB 18	.1875	.125	X	X	X	X	X	X	X	X	X	X	X								IAE 2
ICB 25	.2500	.125	X	X	X	X	X	X	X	X	X	X	X								IAE 3
ICB 31	.3125	.125	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 4
ICB 37	.3750	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
ICB 43	.4375	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
ICB 50	.5000	.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
ICB 62	.6250	.250			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
ICB 75	.7500	.250				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
ICB 87	.8750	.250					X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
ICB 100	1.0000	.250					X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
ICB 125	1.2500	.250							X	X	X	X	X	X	X	X	X	X	X	X	IAE 9

SHOULDER PUNCHES

SELECTIVE/SOLID



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK D	ROUND	SHAPE		OVERALL LENGTH "L"																	
		RANGE P	MIN W	MAX G/P	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	5.50	6.00	7.00
IP_12	.1250	.062-.1249	.062	.1250	X	X	X	X	X	X	X											
IP_18	.1875	.062-.1874	.062	.1875	X	X	X	X	X	X	X	X	X	X	X							
IP_25	.2500	.078-.2499	.078	.2500	X	X	X	X	X	X	X	X	X	X	X	X						
IP_31	.3125	.093-.3124	.093	.3125	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
IP_37	.3750	.125-.3749	.125	.3750		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_43	.4375	.187-.4374	.187	.4375		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_50	.5000	.250-.4999	.187	.5000			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_62	.6250	.375-.6249	.250	.6250			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_75	.7500	.500-.7499	.312	.7500				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_87	.8750	.562-.8749	.312	.8750					X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_100	1.0000	.687-.9999	.375	1.0000					X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_125	1.2500	.937-1.2499	.500	1.2500							X	X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63
Heads HRC 45-55

Standard Point Tolerance

Round P $\begin{matrix} +.0005 \\ -.0000 \end{matrix}$ P to D $\begin{matrix} \text{.0005} \\ \text{.001} \end{matrix}$

Shape P, W $\pm .0005$ P to D $\begin{matrix} \text{.0005} \\ \text{.001} \end{matrix}$

Alternate Point Tolerance

T2

P, W TOLERANCE $\begin{matrix} +.0002 \\ -.0000 \end{matrix}$

P to D $\begin{matrix} \text{.0003} \\ \text{.001} \end{matrix}$

STANDARD FLAT LOCATION IS AT 0° AS SHOWN. AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

CATALOG TYPE	SHANK DIA D	HEAD THICK T	POINT LENGTH "B"				
			NAPMA STD	ALTERNATES			
				B MIN L=1.75	C MIN L=2.00	D MIN L=2.25	E MIN L=2.50
IP_12	.1250	.125	.44	.75	1.00		
IP_18	.1875	.125	.44	.75	1.00		
IP_25	.2500	.188	.50	.75	1.00	1.25	
IP_31	.3125	.188	.56	.75	1.00	1.25	1.50
IP_37	.3750	.188	.62	.75	1.00	1.25	1.50
IP_43	.4375	.188	.75	.75	1.00	1.25	1.50
IP_50	.5000	.188	.81	.75	1.00	1.25	1.50
IP_62	.6250	.188	.94	.75	1.00	1.25	1.50
IP_75	.7500	.188	1.06	.75	1.00	1.25	1.50
IP_87	.8750	.188	1.12	.75	1.00	1.25	1.50
IP_100	1.0000	.188	1.25	.75	1.00	1.25	1.50
IP_125	1.2500	.188	1.50	.75	1.00	1.25	1.50

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE

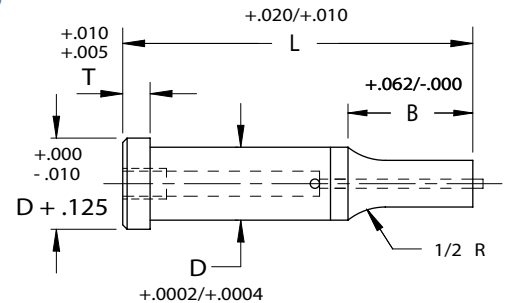
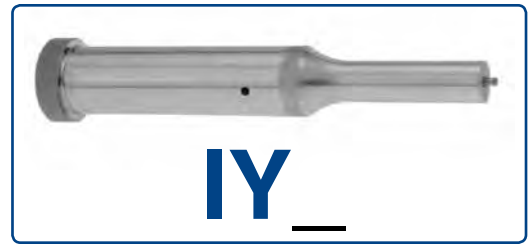
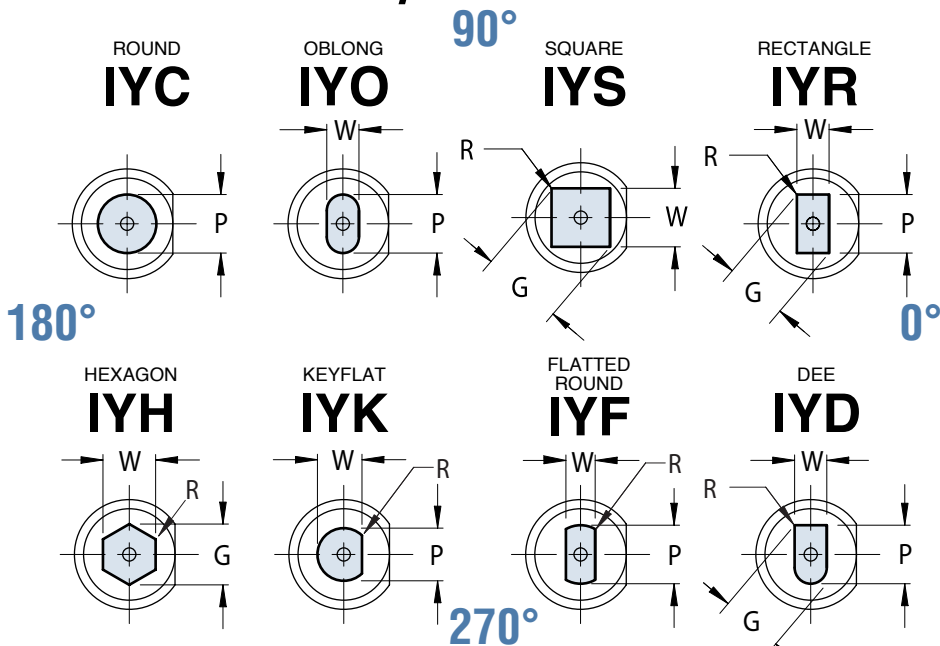
EXAMPLE: 4 IPC 50 5.00 1.00 .435 T2

EXAMPLE: 8 IPO 87 4.50 .75 .750 x .625 F1 @ 90

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

SHOULDER PUNCHES

SELECTIVE/EJECTOR



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.
Complete design & CAD files visit WWW.MOELLERMCAD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG TYPE	SHANK D	ROUND	SHAPE		OVERALL LENGTH "L"																		
		RANGE P	MIN W	MAX G/P	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
IY_ 18	.1875	.062-.1874	.062	.1875	X	X	X	X	X	X	X	X	X	X	X								
IY_ 25	.2500	.078-.2499	.078	.2500	X	X	X	X	X	X	X	X	X	X	X								
IY_ 31	.3125	.125-.3124	.125	.3125	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 37	.3750	.125-.3749	.125	.3750		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 43	.4375	.187-.4374	.187	.4375		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 50	.5000	.250-.4999	.187	.5000			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 62	.6250	.375-.6249	.250	.6250			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 75	.7500	.500-.7499	.312	.7500				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 87	.8750	.562-.8749	.312	.8750					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 100	1.0000	.687-.9999	.375	1.0000					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IY_ 125	1.2500	.937-1.2499	.500	1.2500							X	X	X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63
Heads HRC 45-55

Standard Point Tolerance

Round P $\begin{matrix} +.0005 \\ -.0000 \end{matrix}$.0005 P to D
Shape P, W $\pm .0005$.001 P to D

Alternate Point Tolerance

T2

P, W TOLERANCE $\begin{matrix} +.0002 \\ -.0000 \end{matrix}$
P to D $\begin{matrix} .0003 \end{matrix}$

ORDER EXAMPLE:

(Reference page 4)
SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE
EXAMPLE: 2 IYC 62 3.00 .75 .552 T2
EXAMPLE: 6 IYO 87 4.50 1.25 .790 x .685 F6 F = .390
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD FLAT LOCATION IS AT 0° AS SHOWN. AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

CATALOG TYPE	SHANK D	HEAD DIM T	POINT LENGTH "B"					EJECTOR SIZE
			NAPMA STD	ALTERNATES				
IY_ 18	.1875	.125	.43	.75	1.00			IAE 2
IY_ 25	.2500	.188	.50	.75	1.00			IAE 3
IY_ 31	.3125	.188	.56	.75	1.00	1.25	1.50	IAE 4
IY_ 37	.3750	.188	.62	.75	1.00	1.25	1.50	IAE 6
IY_ 43	.4375	.188	.75	.75	1.00	1.25	1.50	IAE 6
IY_ 50	.5000	.188	.81	.75	1.00	1.25	1.50	IAE 6
IY_ 62	.6250	.188	.94	.75	1.00	1.25	1.50	IAE 9
IY_ 75	.7500	.188	1.06	.75	1.00	1.25	1.50	IAE 9
IY_ 87	.8750	.188	1.12	.75	1.00	1.25	1.50	IAE 9
IY_ 100	1.0000	.188	1.25	.75	1.00	1.25	1.50	IAE 9
IY_ 125	1.2500	.188	1.50	.75	1.00	1.25	1.50	IAE 9

SHOULDER PILOTS

SELECTIVE/PILOT

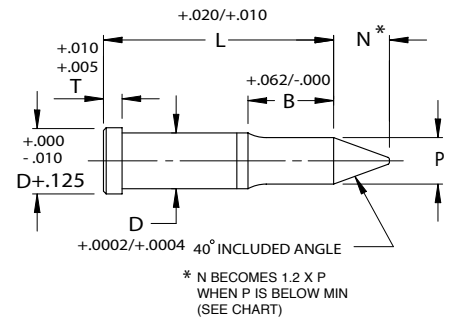
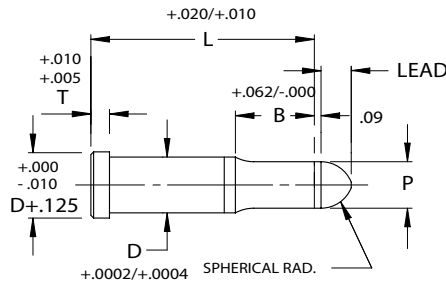
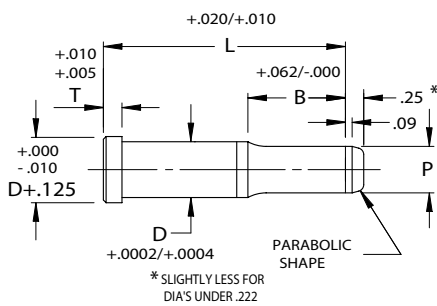
STANDARD STYLE



BULLET NOSE STYLE



LONG LEAD STYLE



P DIM	LEAD
.062-.374	5/32
.375-UP	13/32

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	SHANK DIA D	POINT RANGE P	LEAD N	P BELOW SEE NOTE*	LENGTH "L"																
					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	5.50	6.00
IP_12	.1250	.062-.1250	.12	.092	X	X	X	X	X	X	X										
IP_18	.1875	.062-.1875	.18	.124	X	X	X	X	X	X	X	X	X								
IP_25	.2500	.078-.2500	.25	.175	X	X	X	X	X	X	X	X	X	X							
IP_31	.3125	.093-.3125	.31	.219	X	X	X	X	X	X	X	X	X	X	X	X					
IP_37	.3750	.125-.3750	.37	.262		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_43	.4375	.187-.4375	.43	.306		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_50	.5000	.250-.5000	.50	.357			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_62	.6250	.375-.6250	.62	.444			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_75	.7500	.500-.7500	.75	.539				X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_87	.8750	.562-.8750	.87	.630				X	X	X	X	X	X	X	X	X	X	X	X	X	X
IP_100	1.0000	.687-1.0000	1.00	.721					X	X	X	X	X	X	X	X	X	X	X	X	X
IP_125	1.2500	.937-1.2500	1.25	.903							X	X	X	X	X	X	X	X	X	X	X

Material

Steel: M2, HRC 60-63
Heads: HRC 45-55

Standard Point Tolerance

Round P: +.0005, -.0000
Symbol: .0005 P to D

Alternate Point Tolerance

T2

P, W TOLERANCE: +.0002, -.0000
P to D: .0003

ORDER EXAMPLE:

(Reference page 4)
SPECIFY: QTY: TYPE "D" "L" POINT LENGTH P(OR P&W) DIMENSIONS ALTERATION CODE
EXAMPLE: 3 IPP 62 5.00 1.00 .435 X1 = 4.85
EXAMPLE: 7 IPA 87 5.50 .75 .770 T2

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

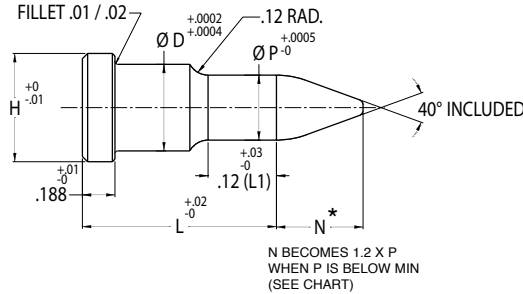
CATALOG TYPE	SHANK DIA D	HEAD THICK T	POINT LENGTH "B"			
			NAPMA	ALTERNATES		
			STD	B MIN L=1.75	C MIN L=2.00	D MIN L=2.25
IP_12	.1250	.125	.44	.75	1.00	
IP_18	.1875	.125	.44	.75	1.00	
IP_25	.2500	.188	.50	.75	1.00	1.25
IP_31	.3125	.188	.56	.75	1.00	1.25
IP_37	.3750	.188	.62	.75	1.00	1.25
IP_43	.4375	.188	.75	.75	1.00	1.25
IP_50	.5000	.188	.81	.75	1.00	1.25
IP_62	.6250	.188	.94	.75	1.00	1.25
IP_75	.7500	.188	1.06	.75	1.00	1.25
IP_87	.8750	.188	1.12	.75	1.00	1.25
IP_100	1.0000	.188	1.25	.75	1.00	1.25
IP_125	1.2500	.188	1.50	.75	1.00	1.25

SHOULDER PILOTS

MOELLER
PRECISION TOOL

SELECTIVE/COMPACT PILOT

POINTED STYLE



Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P +.0005
-.0000

⊙ .0005 P to D

Alternate Hole Tolerance

T2

P, TOLERANCE +.0002
-.0000

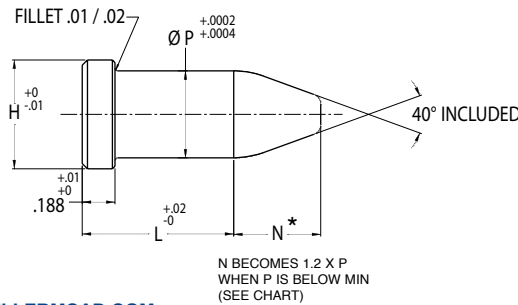
P to D .0003 ⊙

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE POINTED	SHANK DIA D RANGE	DIA P RANGE	LEAD N	P BELOW SEE NOTE*	T	LENGTH "L"							
						H	0.625	0.750	0.875	1.000	1.125	1.250	1.375
IPW 25	0.2500	.1400 - .2499	0.25	.175	0.188	0.375	X	X	X	X	X	X	X
IPW 31	0.3125	.1840 - .3124	0.31	.219	0.188	0.438	X	X	X	X	X	X	X
IPW 37	0.3750	.2620 - .3749	0.37	.262	0.188	0.500	X	X	X	X	X	X	X
IPW 43	0.4375	.2280 - .4374	0.43	.306	0.188	0.562	X	X	X	X	X	X	X
IPW 50	0.5000	.2700 - .4999	0.50	.357	0.188	0.625	X	X	X	X	X	X	X
IPW 62	0.6250	.4050 - .6249	0.62	.444	0.188	0.750		X	X	X	X	X	X
IPW 75	0.7500	.5040 - .7499	0.75	.539	0.188	0.875		X	X	X	X	X	X
IPW 87	0.8750	.5920 - .8749	0.87	.630	0.188	1.000		X	X	X	X	X	X
IPW 100	1.0000	.6860 - .9999	1.00	.721	0.188	1.125		X	X	X	X	X	X

STRAIGHT STYLE



Material

Steel: M2, HRC 60-63

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSION ALTERATION CODE

EXAMPLE: 4 IPV 62 1.00 .554 X1 = .900

EXAMPLE: 2 IPV 1.25 .675 X4 = .175

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

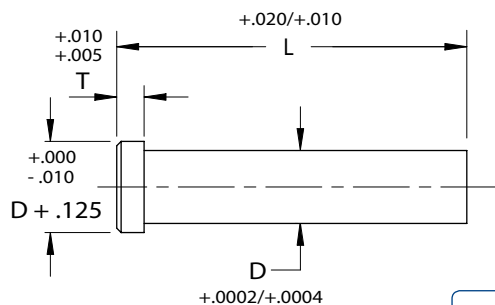
Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE STRAIGHT	SHANK DIA P RANGE	LEAD N	P BELOW SEE NOTE*	T	LENGTH "L"							
					H	0.625	0.750	0.875	1.000	1.125	1.250	1.375
IPV 25	.1876 - .2500	0.25	.175	0.188	0.375	X	X	X	X	X	X	X
IPV 31	.2501 - .3125	0.31	.219	0.188	0.438	X	X	X	X	X	X	X
IPV 37	.3126 - .3750	0.37	.262	0.188	0.500	X	X	X	X	X	X	X
IPV 43	.3751 - .4375	0.43	.306	0.188	0.562	X	X	X	X	X	X	X
IPV 50	.4376 - .5000	0.50	.357	0.188	0.625	X	X	X	X	X	X	X
IPV 62	.5001 - .6250	0.62	.444	0.188	0.750		X	X	X	X	X	X
IPV 75	.6251 - .7500	0.75	.539	0.188	0.875		X	X	X	X	X	X
IPV 87	.7501 - .8750	0.87	.630	0.188	1.000		X	X	X	X	X	X
IPV 100	.8751 - 1.000	1.00	.721	0.188	1.125		X	X	X	X	X	X

SHOULDER PUNCH BLANKS

MOELLER
PRECISION TOOL

SELECTIVE/SOLID/EJECTOR



Material

Steel: M2, HRC 60-62
Heads HRC 45-55

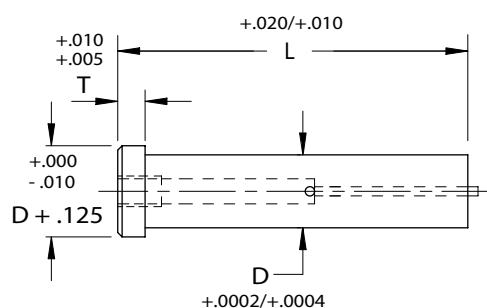
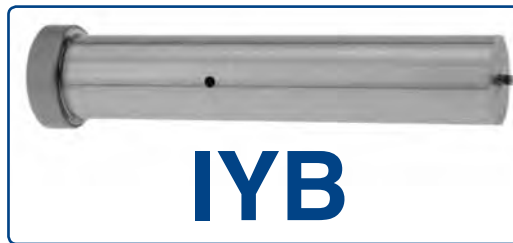
ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L"

EXAMPLE: 4 IPB 62 5.00

EXAMPLE: 3 IYB 87 3.50



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

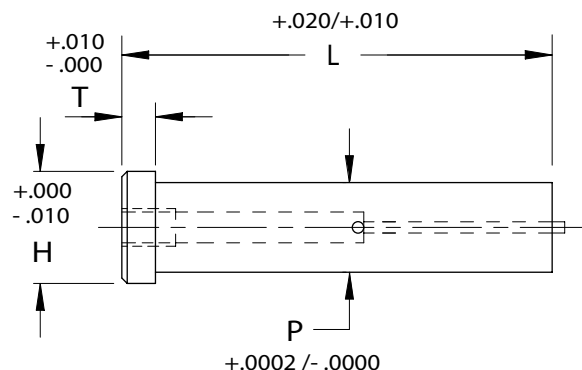
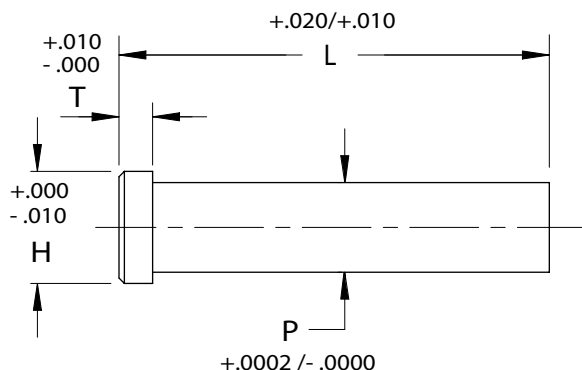
CATALOG NUMBER SOLID	SHANK DIA D	HEAD DIM T	OVERALL LENGTH "L"																
			1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	6.00	7.00
IPB 12	.1250	.125	X	X	X	X	X	X	X	X									
IPB 18	.1875	.125	X	X	X	X	X	X	X	X	X	X	X						
IPB 25	.2500	.188	X	X	X	X	X	X	X	X	X	X	X	X					
IPB 31	.3125	.188	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
IPB 37	.3750	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPB 43	.4375	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPB 50	.5000	.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPB 62	.6250	.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPB 75	.7500	.188				X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPB 87	.8750	.188					X	X	X	X	X	X	X	X	X	X	X	X	X
IPB 100	1.0000	.188					X	X	X	X	X	X	X	X	X	X	X	X	X
IPB 125	1.2500	.188							X	X	X	X	X	X	X	X	X	X	X

CATALOG NUMBER EJECTOR	SHANK DIA D	HEAD DIM T	OVERALL LENGTH "L"																			EJECTOR SIZE
			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	
IYB 18	.1875	.125	X	X	X	X	X	X	X	X	X	X	X									IAE 2
IYB 25	.2500	.188	X	X	X	X	X	X	X	X	X	X	X									IAE 3
IYB 31	.3125	.188	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 4
IYB 37	.3750	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
IYB 43	.4375	.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
IYB 50	.5000	.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 6
IYB 62	.6250	.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
IYB 75	.7500	.188				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
IYB 87	.8750	.188					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
IYB 100	1.0000	.188					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9
IYB 125	1.2500	.188							X	X	X	X	X	X	X	X	X	X	X	X	X	IAE 9

REDUCED SHANK PUNCHES **MOELLER**

PRECISION TOOL

SOLID/EJECTOR



Material

Steel: M2, HRC 60-63
Heads HRC 45-55

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: CATALOG NUMBER "P" "L"

EXAMPLE: 5 IPX 62 .560 5.00

EXAMPLE: 8 IYX 37 .355 3.50

Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

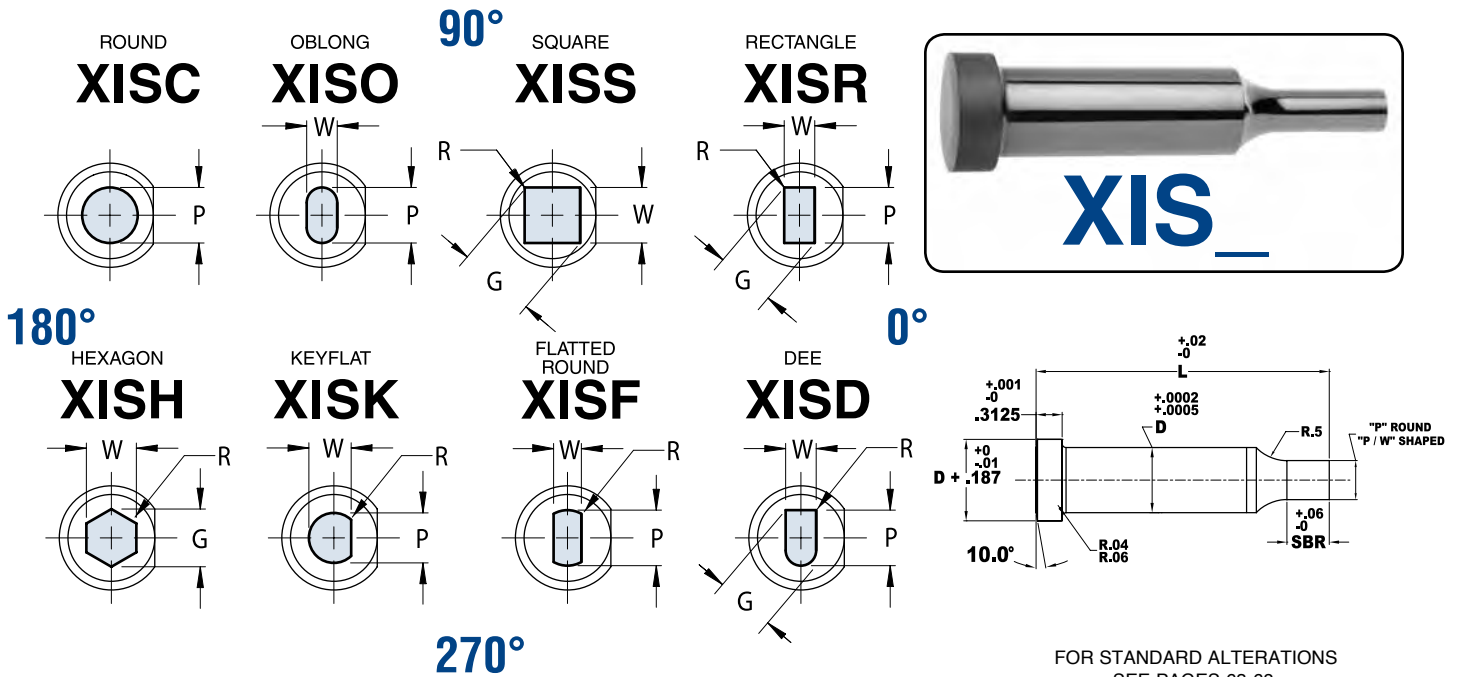
Complete design & CAD files visit WWW.MOELLERMCAD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG NUMBER SOLID	SHANK DIA P RANGE	HEAD DIM H	HEAD DIM T	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	4.25	4.50	4.75	5.00	5.50	6.00
IPX 18	.1251-.1875	0.312	0.125	X	X	X	X	X	X	X	X	X	X	X						
IPX 25	.1876-.2500	0.375	0.188	X	X	X	X	X	X	X	X	X	X	X	X					
IPX 31	.2501-.3125	0.437	0.188	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPX 37	.3126-.3750	0.500	0.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPX 43	.3751-.4375	0.562	0.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPX 50	.4376-.5000	0.625	0.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IPX 62	.5001-.6250	0.750	0.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

CATALOG NUMBER EJECTOR	SHANK DIA P RANGE	HEAD DIM H	HEAD DIM T	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	4.25	4.50	4.75	5.00	
IYX 25	.1876-.2500	0.375	0.188	X	X	X	X	X	X	X	X	X	X	X					
IYX 31	.2501-.3125	0.437	0.188	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IYX 37	.3126-.3750	0.500	0.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IYX 43	.3751-.4375	0.562	0.188		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IYX 50	.4376-.5000	0.625	0.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X
IYX 62	.5001-.6250	0.750	0.188			X	X	X	X	X	X	X	X	X	X	X	X	X	X

SOLID



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

CATALOG TYPE	SHANK D	ROUND	SHAPE		OVERALL LENGTH "L"							
		RANGE P	MIN W	MAX G/P	2.50	3.00	3.25	3.50	3.75	4.00	4.50	5.00
XIS_37	.3750	.158-.3749	.158	.3750	X	X	X	X	X	X	X	X
XIS_43	.4375	.187-.4374	.187	.4375	X	X	X	X	X	X	X	X
XIS_50	.5000	.250-.4999	.187	.5000	X	X	X	X	X	X	X	X
XIS_62	.6250	.375-.6249	.250	.6250	X	X	X	X	X	X	X	X
XIS_75	.7500	.500-.7499	.312	.7500	X	X	X	X	X	X	X	X
XIS_87	.8750	.562-.8749	.312	.8750	X	X	X	X	X	X	X	X
XIS_100	1.0000	.687-.9999	.375	1.0000	X	X	X	X	X	X	X	X

Material

Steel: CPM M4 HRC 60-62
Heads HRC 40-55

Standard Point Tolerance

Round P $\pm .0005$
- .0000

☐ .0005 P to D

Shape P, W $\pm .0005$

☐ .001 P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" LENGTH DIMENSIONS ALTERATION CODE

EXAMPLE: 6 XISC 50 5.00 1.00 .435 F1

EXAMPLE: 6 XISO 87 3.50 .75 .750 x .625 F1 @ 90

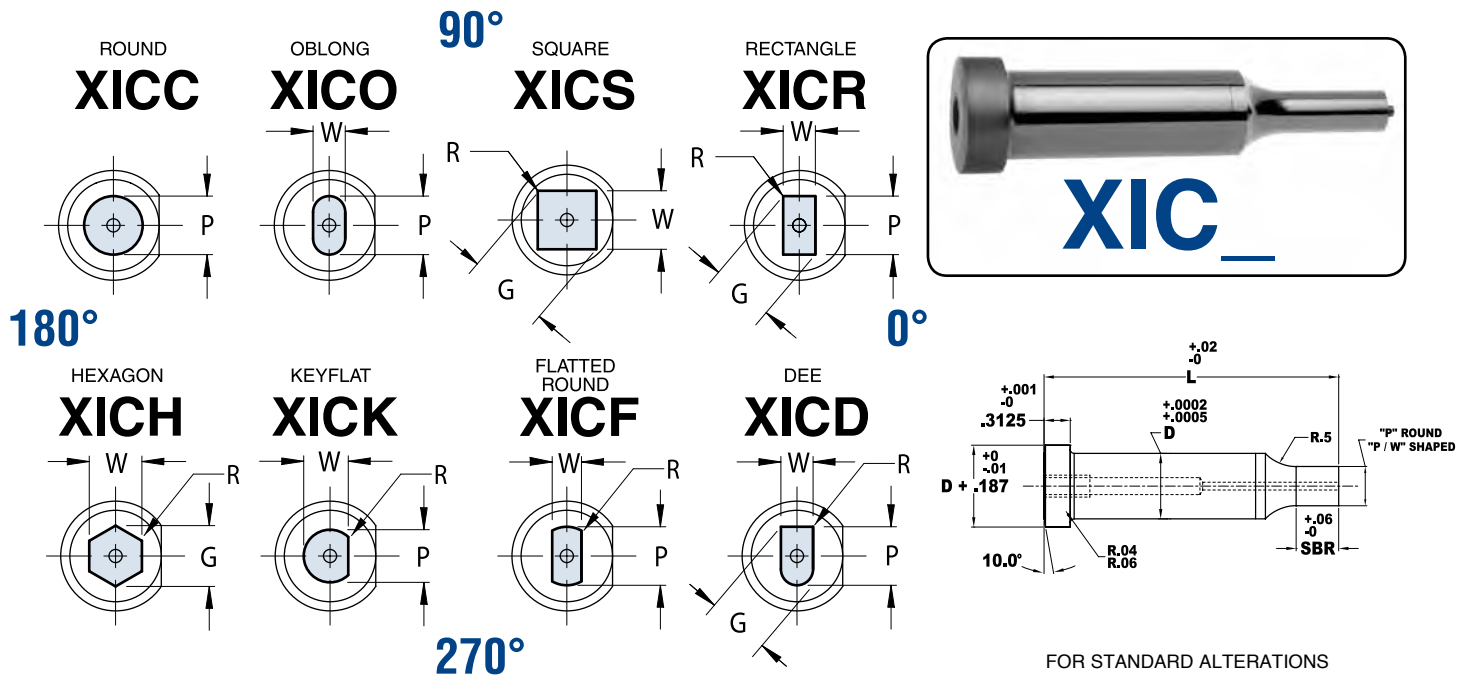
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK D	POINT LENGTH "SBR"		
		STD	ALTERNATES	
			B	C
XIS_37	.3750	.50	.75	1.00
XIS_43	.4375	.50	.75	1.00
XIS_50	.5000	.50	.75	1.00
XIS_62	.6250	.50	.75	1.00
XIS_75	.7500	.50	.75	1.00
XIS_87	.8750	.50	.75	1.00
XIS_100	1.000	.50	.75	1.00

STANDARD FLAT LOCATION IS AT 0° AS SHOWN.

AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

EJECTOR



VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY.

FOR STANDARD ALTERATIONS
SEE PAGES 63-68.

CATALOG TYPE	SHANK D	ROUND	SHAPE		OVERALL LENGTH "L"							
		RANGE P	MIN W	MAX G/P	2.50	3.00	3.25	3.50	3.75	4.00	4.50	5.00
XIC_37	.3750	.187-.3749	.187	.3750	X	X	X	X	X	X	X	X
XIC_43	.4375	.187-.4374	.187	.4375	X	X	X	X	X	X	X	X
XIC_50	.5000	.250-.4999	.187	.5000	X	X	X	X	X	X	X	X
XIC_62	.6250	.375-.6249	.250	.6250	X	X	X	X	X	X	X	X
XIC_75	.7500	.500-.7499	.312	.7500	X	X	X	X	X	X	X	X
XIC_87	.8750	.562-.8749	.312	.8750	X	X	X	X	X	X	X	X
XIC_100	1.0000	.687-.9999	.375	1.0000	X	X	X	X	X	X	X	X

Material

Steel: CPM M4 HRC 60-62
Heads HRC 40-55

Standard Point Tolerance

Round P $\pm .0005$
- .0000

.0005 P to D

Shape P, W $\pm .0005$

.001 P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" POINT P(OR P&W) ALTERATION
LENGTH DIMENSIONS CODE

EXAMPLE: 6 XICC 50 5.00 1.00 .435 F1

EXAMPLE: 6 XICO 87 3.50 .75 .750 x .625 F1 @ 90

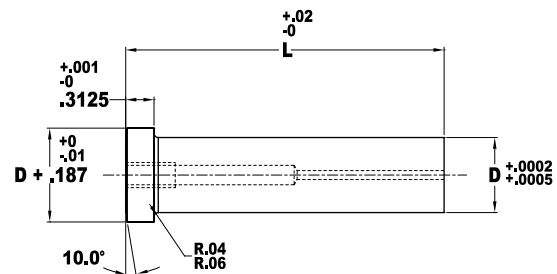
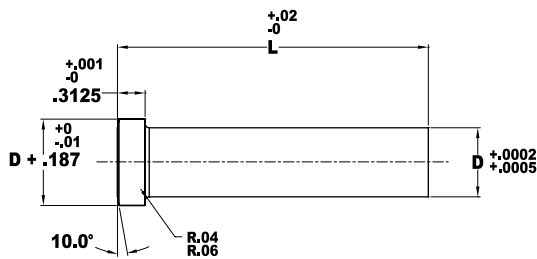
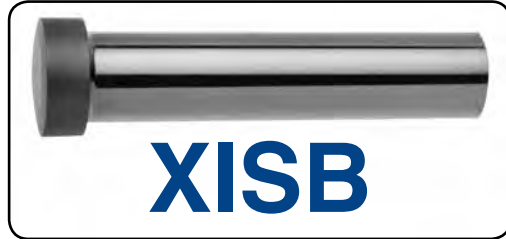
Note: When ordering, standard quantity breaks are: 1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG TYPE	SHANK D	POINT LENGTH "SBR"			EJECTOR SIZE
		STD	ALTERNATES		
			B	C	
XIC_37	.3750	.50	.75	1.00	IAE 6
XIC_43	.4375	.50	.75	1.00	IAE 6
XIC_50	.5000	.50	.75	1.00	IAE 6
XIC_62	.6250	.50	.75	1.00	IAE 9
XIC_75	.7500	.50	.75	1.00	IAE 9
XIC_87	.8750	.50	.75	1.00	IAE 9
XIC_100	1.000	.50	.75	1.00	IAE 9

STANDARD FLAT LOCATION IS AT 0° AS SHOWN.

AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

BASIC/SOLID/EJECTOR



Material

Steel: CPM M4 HRC 60-62
Heads HRC 40-55

FOR STANDARD ALTERATIONS
SEE PAGES 63-68.

CATALOG NUMBER SOLID	SHANK DIA D	OVERALL LENGTH "L"							
		2.50	3.00	3.25	3.50	3.75	4.00	4.50	5.00
XISB 37	.3750	X	X	X	X	X	X	X	X
XISB 43	.4375	X	X	X	X	X	X	X	X
XISB 50	.5000	X	X	X	X	X	X	X	X
XISB 62	.6250	X	X	X	X	X	X	X	X
XISB 75	.7500	X	X	X	X	X	X	X	X
XISB 87	.8750	X	X	X	X	X	X	X	X
XISB 100	1.0000	X	X	X	X	X	X	X	X

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L"

EXAMPLE: 6 XISB 43 4.00

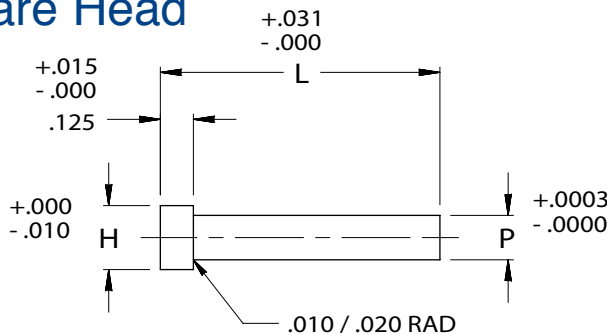
EXAMPLE: 6 XICB 62 3.50

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

CATALOG NUMBER EJECTOR	SHANK DIA D	OVERALL LENGTH "L"								EJECTOR SIZE
		2.50	3.00	3.25	3.50	3.75	4.00	4.50	5.00	
XICB 37	.3750	X	X	X	X	X	X	X	X	IAE 6
XICB 43	.4375	X	X	X	X	X	X	X	X	IAE 6
XICB 50	.5000	X	X	X	X	X	X	X	X	IAE 6
XICB 62	.6250	X	X	X	X	X	X	X	X	IAE 9
XICB 75	.7500	X	X	X	X	X	X	X	X	IAE 9
XICB 87	.8750	X	X	X	X	X	X	X	X	IAE9
XICB 100	1.0000	X	X	X	X	X	X	X	X	IAE 9

QUILL PUNCHES

Square Head



Complete design & CAD files visit WWW.MOELLERMCAD.COM

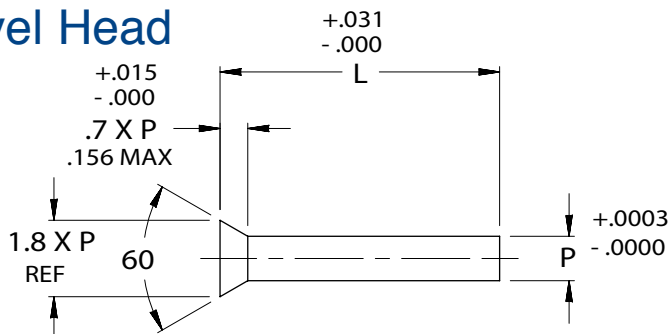
CATALOG TYPE	RANGE P	HEAD DIA. H	OVERALL LENGTH "L"				
			STD. L	OPTIONAL LENGTHS			
			2.50	1.50	1.75	2.00	2.25
IQS 01	.030-.0625	.093	X	X	X	X	X
IQS 02	.063-.0937	.156	X	X	X	X	X
IQS 03	.094-.1250	.187	X	X	X	X	X
IQS 04	.126-.1562	.218	X	X	X	X	X
IQS 05	.157-.1875	.250	X	X	X	X	X
IQS 06	.188-.2187	.281	X	X	X	X	X
IQS 07	.219-.2500	.312	X	X	X	X	X

Material

Steel: M2, HRC 60-63

"P" Dimension must be ordered in 3 decimal places, except for fractional sizes of 1/16, 3/32, 1/8, 5/32, 3/16, 7/32 & 1/4. Other four place sizes are P.O.R.

Bevel Head



Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG TYPE	RANGE P	OVERALL LENGTH "L"				
		STD. L	OPTIONAL LENGTHS			
		2.50	1.50	1.75	2.00	2.25
IQB 01	.030-.0625	X	X	X	X	X
IQB 02	.063-.0937	X	X	X	X	X
IQB 03	.094-.1250	X	X	X	X	X
IQB 04	.126-.1562	X	X	X	X	X
IQB 05	.157-.1875	X	X	X	X	X
IQB 06	.188-.2187	X	X	X	X	X
IQB 07	.219-.2500	X	X	X	X	X
IQB 08	.251-.3360	X	X	X	X	X
IQB 09	.337-.3750	X	X	X	X	X

Material

Steel: M2, HRC 60-63

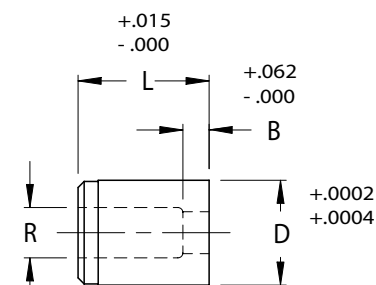
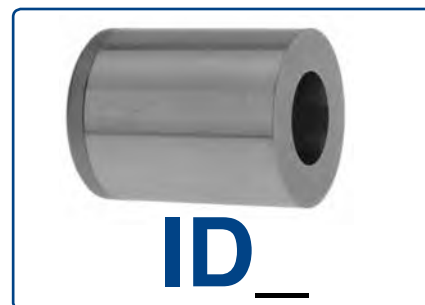
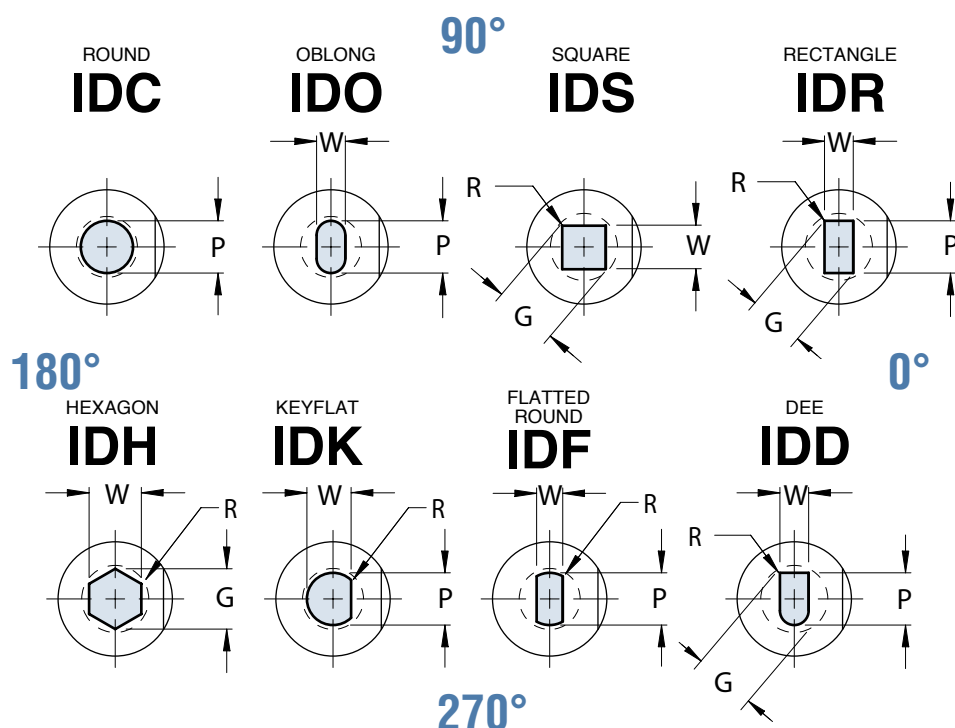
ORDER EXAMPLE:

(Reference page 4)
SPECIFY: QTY: TYPE "P" "L" ALTERATION CODE
EXAMPLE: 2 IQS 04 .153 2.00 X1 = 1.90
EXAMPLE: 6 IQB 07 .235 1.75
Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

"P" Dimension must be ordered in 3 decimal places, except for fractional sizes of 1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16 & 3/8. Other four place sizes are P.O.R.

PRESS-FIT BUTTONS

COUNTER BORE RELIEF



R = P or G plus .030 min/.125 max

VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG TYPE	BODY DIA D	DIE LAND B	MAX DIA R	ROUND	SHAPE		OVERALL LENGTH "L"						
				RANGE P	MIN W	MAX G/P	.750	.875	.937	1.000	1.125	1.250	1.500
ID_25	.2500	.156	.156	.064-.125	N/A	N/A	X	X	X	X	X	X	
ID_31	.3125	.156	.188	.064-.156	.064	.156	X	X	X	X	X	X	X
ID_37	.3750	.156	.234	.064-.195	.064	.195	X	X	X	X	X	X	X
ID_43	.4375	.156	.281	.064-.250	.064	.250	X	X	X	X	X	X	X
ID_50	.5000	.156	.328	.064-.285	.093	.285	X	X	X	X	X	X	X
ID_62	.6250	.188	.375	.137-.345	.093	.345	X	X	X	X	X	X	X
ID_75	.7500	.188	.468	.137-.435	.115	.435	X	X	X	X	X	X	X
ID_87	.8750	.188	.578	.275-.545	.125	.545	X	X	X	X	X	X	X
ID_100	1.0000	.250	.687	.359-.655	.156	.655	X	X	X	X	X	X	X
ID_125	1.2500	.312	.843	.506-.803	.187	.803	X	X	X	X	X	X	X
ID_150	1.5000	.312	1.093	.617-1.052	.250	1.052	X	X	X	X	X	X	X

Material

Steel: STD A-2, HRC 58-60
Alternate M2, HRC 60-63

Standard Point Tolerance

Round P +.0005
-.0000

Shape P,W +.001
-.000

⊙ .0005 P to D

⊙ .001 P to D

ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSION ALTERATION CODE

EXAMPLE: 4 IDC 50 .875 .235 X2 = .85

EXAMPLE: 8 IDO 87 1.00 .480 X .325 F2

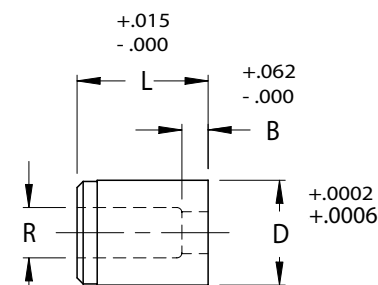
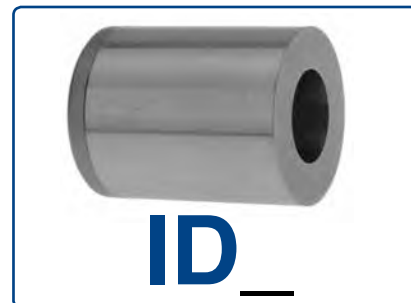
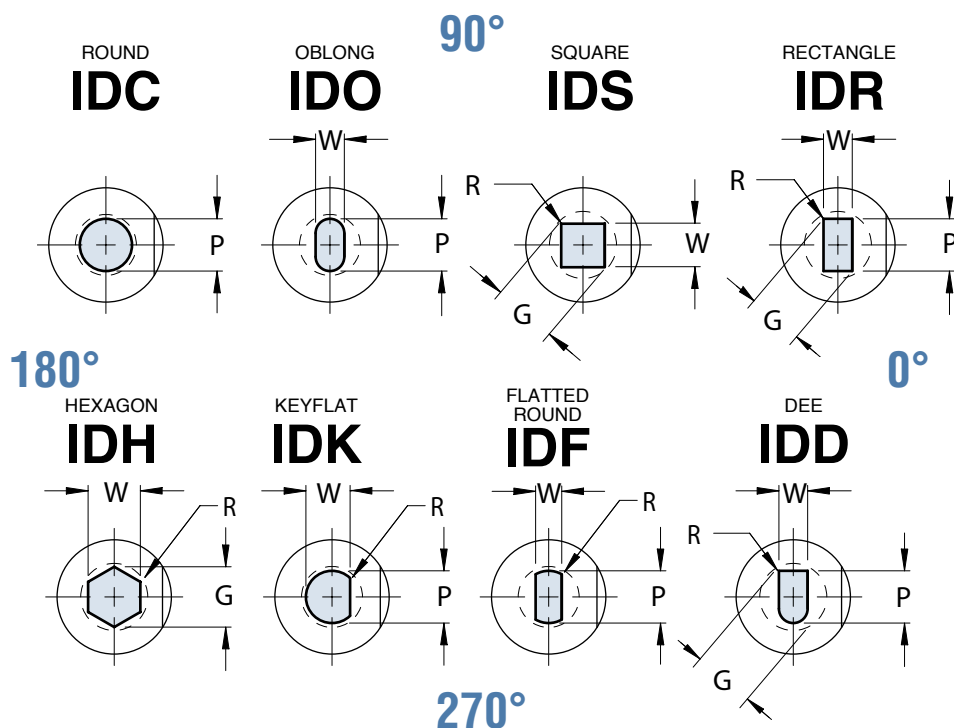
Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD FLAT LOCATION IS AT 0° AS SHOWN. AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

PRESS-FIT BUTTONS

MOELLER
PRECISION TOOL

COUNTER BORE RELIEF/EXTENDED RANGE



R = P or G plus .030 min/.125 max

VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

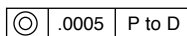
CATALOG TYPE	BODY DIA D	DIE LAND B	MAX DIA R	ROUND	SHAPE		OVERALL LENGTH "L"						
				RANGE P	MIN W	MAX G/P	.750	.875	.937	1.000	1.125	1.250	1.500
ID_175	1.750	.312	1.43	.730-1.400	.250	1.400	X	X	X	X	X	X	X
ID_200	2.000	.312	1.64	.870-1.610	.250	1.610	X	X	X	X	X	X	X
ID_225	2.250	.312	1.85	.990-1.820	.250	1.820	X	X	X	X	X	X	X
ID_250	2.500	.312	2.05	1.120-2.020	.250	2.020	X	X	X	X	X	X	X
ID_275	2.750	.312	2.25	1.230-2.220	.250	2.220	X	X	X	X	X	X	X
ID_300	3.000	.312	2.48	1.400-2.450	.250	2.450	X	X	X	X	X	X	X

Material

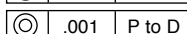
Steel: STD A-2, HRC 58-60
Alternate M2, HRC 60-63

Standard Point Tolerance

Round P +.0005
-.0000



Shape P,W +.001
-.000



ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" DIMENSION P ALTERATION CODE

EXAMPLE: 1 IDC 2.250 .937 1.566 X2 = .900

EXAMPLE: 4 IDO 2.500 1.00 1.620 X .840 F2 @ 90

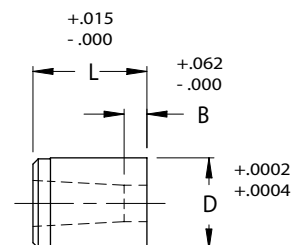
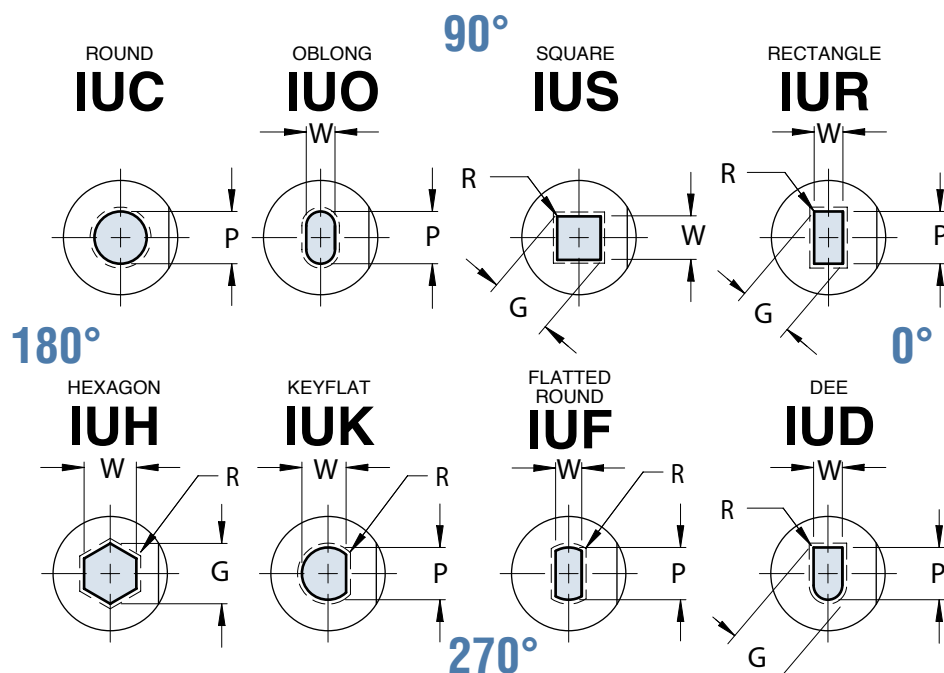
Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD FLAT LOCATION IS AT 0° AS SHOWN. AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

PRESS FIT BUTTONS

MOELLER
PRECISION TOOL

ULTRA LIFE/TAPER RELIEF



VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.
STANDARD TAPER: ROUND 1° PER SIDE/SHAPED 1-1/2° PER SIDE

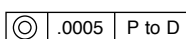
CATALOG TYPE	BODY DIA D	LAND LENGTH “B”					ROUND	SHAPE		OVERALL LENGTH “L”						
		NAPMA	ALTERNATES					MIN W	MAX G/P	.750	.875	.937	1.000	1.125	1.250	1.500
		STD	A	B	C	D	RANGE P									
IU_ 25	.2500	.156	.062	.125	.250	.375	.064-.125	.064	.125	X	X	X	X	X	X	X
IU_ 31	.3125	.156	.062	.125	.250	.375	.064-.156	.064	.156	X	X	X	X	X	X	X
IU_ 37	.3750	.156	.062	.125	.250	.375	.064-.195	.064	.195	X	X	X	X	X	X	X
IU_ 43	.4375	.156	.062	.125	.250	.375	.137-.250	.093	.250	X	X	X	X	X	X	X
IU_ 50	.5000	.156	.062	.125	.250	.375	.137-.285	.093	.285	X	X	X	X	X	X	X
IU_ 62	.6250	.188	.062	.125	.312	.437	.137-.345	.093	.345	X	X	X	X	X	X	X
IU_ 75	.7500	.188	.062	.125	.312	.437	.137-.435	.115	.435	X	X	X	X	X	X	X
IU_ 87	.8750	.188	.062	.125	.375	.500	.275-.545	.125	.545	X	X	X	X	X	X	X
IU_100	1.0000	.250	.062	.125	.375	.500	.359-.655	.156	.655	X	X	X	X	X	X	X
IU_125	1.2500	.312	.062	.125	.500	.625	.506-.803	.187	.803	X	X	X	X	X	X	X
IU_150	1.5000	.312	.062	.125	.500	.625	.617-1.052	.250	1.052	X	X	X	X	X	X	X

Material

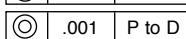
Steel: STD A-2, HRC 58-60
Alternate M2, HRC 60-63

Standard Point Tolerance

Round P +.0005
-.0000



Shape P, W +.001
-.000



Alternate Hole Tolerance

T2

P, W TOLERANCE +.0002
-.0000

P to D .0003

ORDER EXAMPLE:

(Reference page 4)

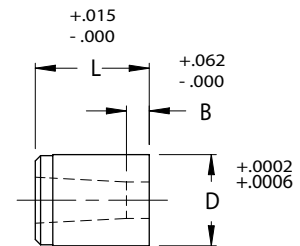
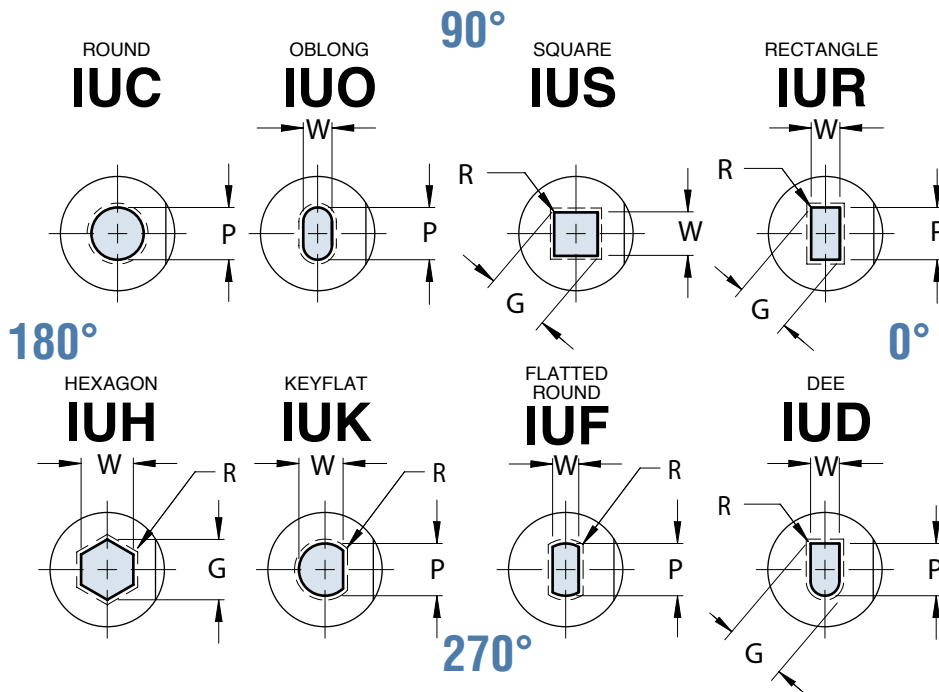
SPECIFY:	QTY:	TYPE	"D"	"L"	P DIMENSION	ALTERATION CODE
EXAMPLE:	9	IUC	62	.875	.305	X2 = .83
EXAMPLE:	4	IUO	87	1.25	.437 X .312	F2

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD FLAT LOCATION IS AT 0° AS SHOWN.
AVAILABLE AT 90°, 180°, 270°, FOR SAME
ALTERATION PRICE.

PRESS FIT BUTTONS

ULTRA LIFE/TAPER RELIEF/EXTENDED RANGE



VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.
STANDARD TAPER: ROUND 1° PER SIDE/SHAPED 1-1/2° PER SIDE

CATALOG TYPE	BODY DIA D	LAND LENGTH "B"					ROUND	SHAPE		OVERALL LENGTH "L"			
		NAPMA	ALTERNATES					MIN W	MAX G/P	1.000	1.125	1.250	1.500
		STD	A	B	C	D	RANGE P						
IU_ 175	1.7500*	.312	.062	.125	.500	.625	.750-1.400	.250	1.400	X	X	X	X
IU_ 200	2.0000*	.312	.062	.125	.500	.625	.875-1.650	.281	1.650	X	X	X	X
IU_ 225	2.2500*	.312	.062	.125	.500	.625	1.000-1.800	.312	1.800	X	X	X	X
IU_ 250	2.5000*	.312	.062	.125	.500	.625	1.125-2.050	.375	2.050	X	X	X	X
IU_ 275	2.7500*	.312	.062	.125	.500	.625	1.250-2.250	.438	2.250	X	X	X	X
IU_ 300	3.0000*	.312	.062	.125	.500	.625	1.375-2.500	.500	2.500	X	X	X	X

Material

Steel: STD A-2, HRC 58-60
Alternate M2, HRC 60-63

Standard Point Tolerance

Round P	+ .0005 - .0000		.0005	P to D
Shape P,W	+ .001 - .000		.001	P to D

ORDER EXAMPLE:

(Reference page 4)

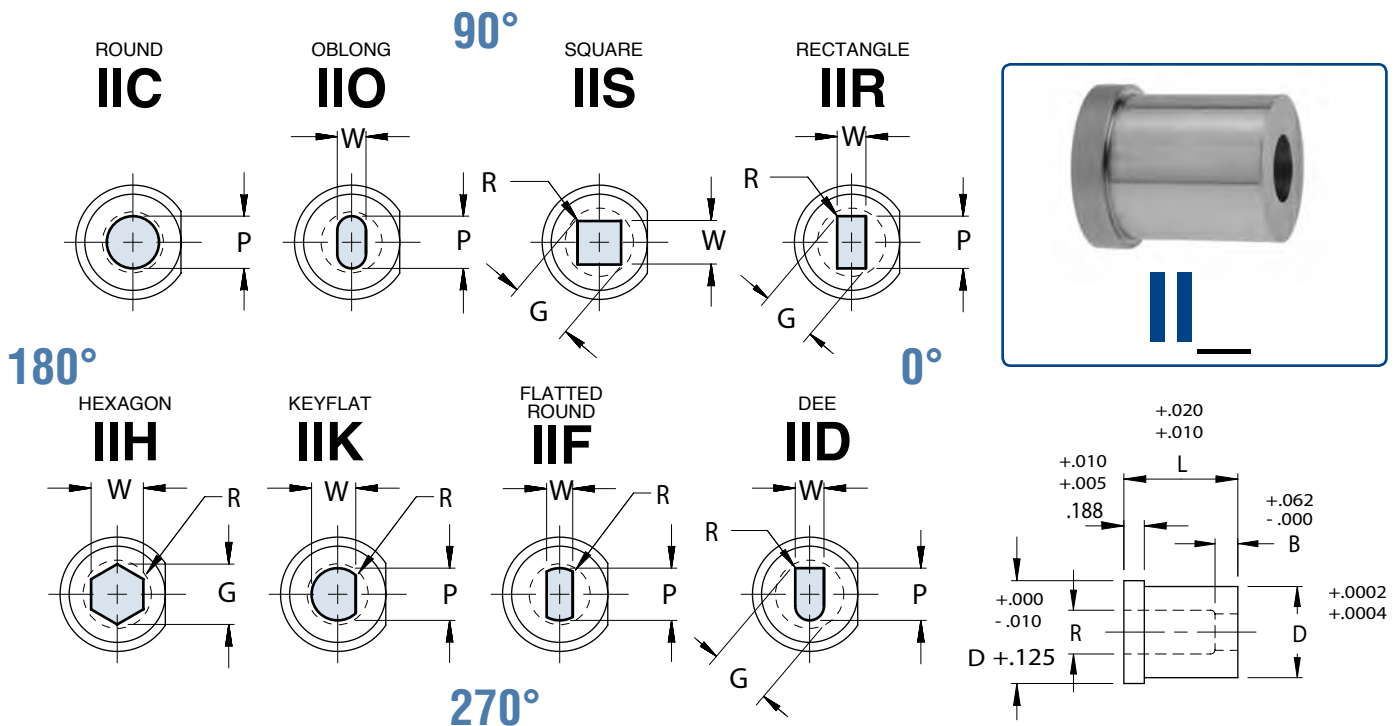
SPECIFY:	QTY:	TYPE	"D"	"L"	P (OR P&W) DIMENSIONS	ALTERATION CODE
EXAMPLE:	4	IUC	2.000	1.25	1.315	X2 = 1.20
EXAMPLE:	3	IUO	1.750	1.00	1.112 X .721	F1

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD FLAT LOCATION IS AT 0° AS SHOWN.
AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

SHOULDER BUTTONS

COUNTER BORE RELIEF



R = P or G plus .030 min/.125 max

VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG TYPE	BODY DIA D	DIE LAND B	MAX DIA R	ROUND	SHAPE		OVERALL LENGTH "L"					
				RANGE P	MIN W	MAX G/P	.750	.875	1.000	1.125	1.250	1.500
II_25	.250	.156	.156	.064-.125	N/A	N/A	X	X	X	X	X	X
II_37	.375	.156	.234	.064-.195	.064	.195	X	X	X	X	X	X
II_50	.500	.156	.328	.064-.285	.093	.285	X	X	X	X	X	X
II_62	.625	.188	.375	.137-.345	.093	.345	X	X	X	X	X	X
II_75	.750	.188	.468	.137-.435	.115	.435	X	X	X	X	X	X
II_87	.875	.188	.578	.275-.545	.125	.545	X	X	X	X	X	X
II_100	1.000	.250	.687	.359-.655	.156	.655	X	X	X	X	X	X
II_125	1.250	.312	.843	.506-.803	.187	.803	X	X	X	X	X	X

Material

Steel: A2, HRC 58-60
Alternate M2, HRC 60-63

Standard Point Tolerance

Round P $\begin{matrix} +.0005 \\ -.0000 \end{matrix}$  .0005 P to D

Shape P, W $\begin{matrix} +.001 \\ -.000 \end{matrix}$  .001 P to D

ORDER EXAMPLE:

(Reference page 4)

P (OR P&W) ALTERATION
SPECIFY: QTY: TYPE "D" "L" DIMENSIONS CODE

EXAMPLE: 2 IIF 87 1.25 .492 X .310 F1

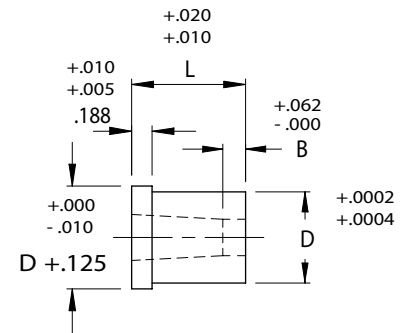
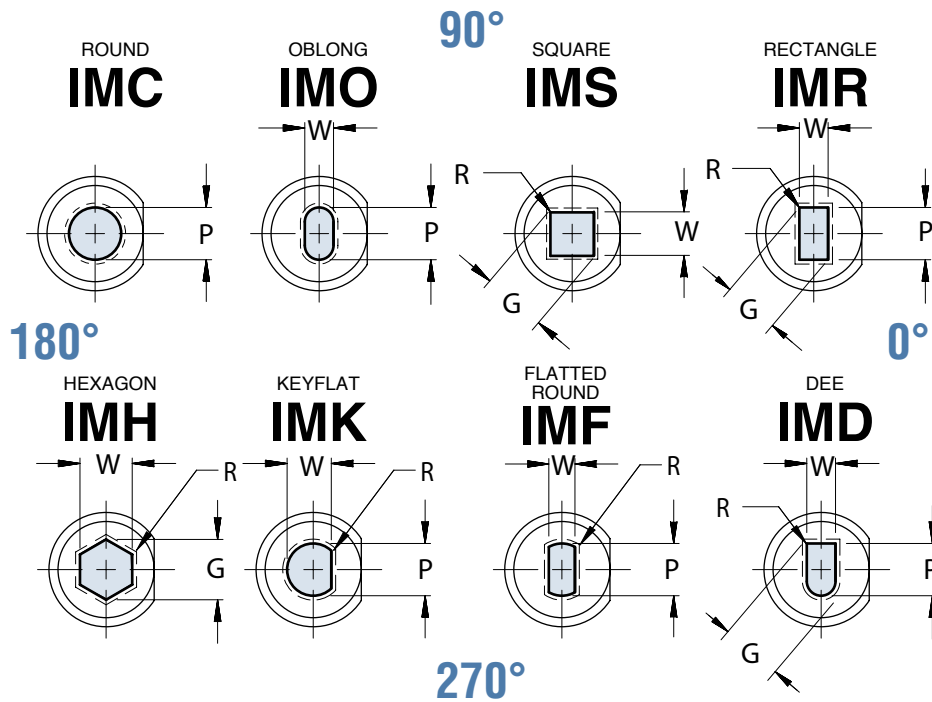
EXAMPLE: 5 IIC 50 1.00 .223 X2 = .97

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD FLAT LOCATION IS AT 0° AS SHOWN. AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

SHOULDER BUTTONS

ULTRA LIFE/TAPER RELIEF



VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.
STANDARD TAPER: ROUND 1° PER SIDE/SHAPED 1-1/2° PER SIDE

CATALOG TYPE	BODY DIA D	LAND LENGTH "B"					ROUND	SHAPE		OVERALL LENGTH "L"				
		NAPMA	ALTERNATES				RANGE P	MIN W	MAX G/P	.875	1.000	1.125	1.250	1.500
		STD	A	B	C	D								
IM_25	.2500	.156	.062	.125	.250	.375	.064 - .115	.064	.115	X	X	X	X	X
IM_31	.3125	.156	.062	.125	.250	.375	.064 - .180	.064	.180	X	X	X	X	X
IM_37	.3750	.156	.062	.125	.250	.375	.064 - .195	.064	.195	X	X	X	X	X
IM_43	.4375	.156	.062	.125	.250	.375	.137 - .250	.093	.250	X	X	X	X	X
IM_50	.5000	.156	.062	.125	.250	.375	.137 - .285	.093	.285	X	X	X	X	X
IM_62	.6250	.187	.062	.125	.312	.437	.137 - .345	.093	.345	X	X	X	X	X
IM_75	.7500	.187	.062	.125	.312	.437	.137 - .435	.115	.435	X	X	X	X	X
IM_87	.8750	.187	.062	.125	.375	.500	.275 - .545	.125	.545	X	X	X	X	X
IM_100	1.0000	.250	.062	.125	.375	.500	.359 - .655	.156	.655	X	X	X	X	X
IM_125	1.2500	.312	.062	.125	.500	.625	.506 - .803	.187	.803	X	X	X	X	X
IM_150	1.5000	.312	.062	.125	.500	.625	.617 - 1.052	.250	1.052	X	X	X	X	X

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P	+ .0005 - .0000	.0005 P to D
Shape P, W	+ .001 - .000	.001 P to D

Alternate Hole Tolerance

T2

P, W TOLERANCE	+ .0002 - .0000
P to D	.0003

ORDER EXAMPLE:

(Reference page 4)

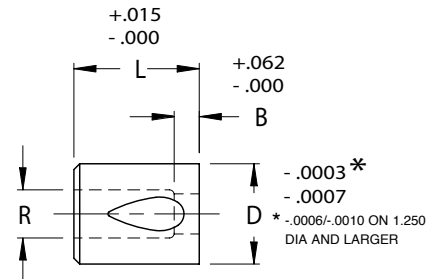
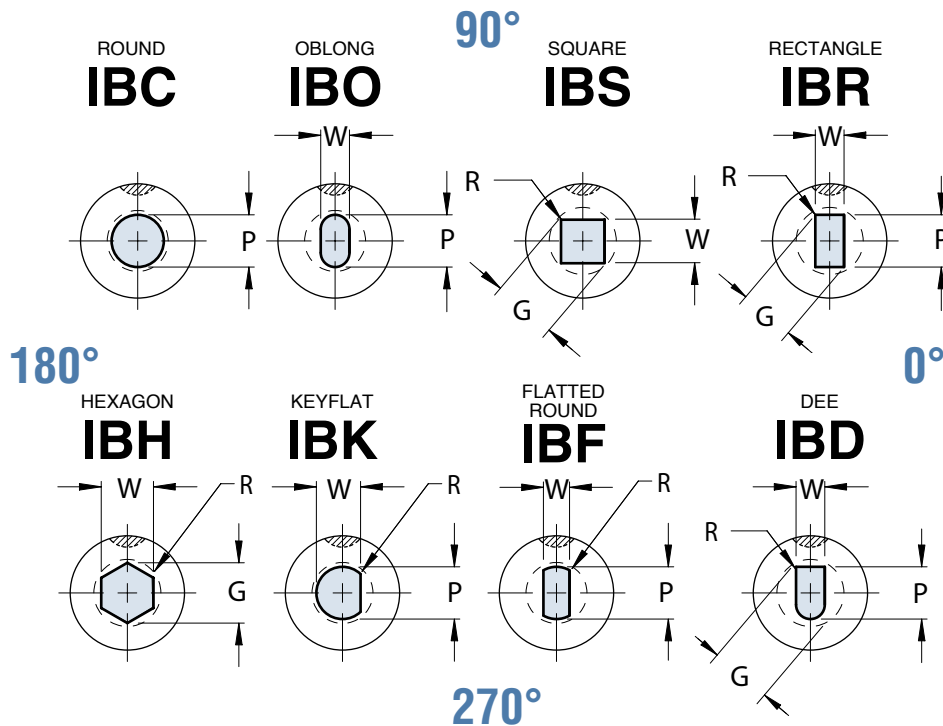
SPECIFY:	QTY:	TYPE	"D"	"L"	P (OR P&W) DIMENSIONS	ALTERATION CODE
EXAMPLE:	6	IMC	43	1.00	.221	
EXAMPLE:	8	IMH	75	1.50	.335	F1

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD FLAT LOCATION IS AT 0° AS SHOWN. AVAILABLE AT 90°, 180°, 270°, FOR SAME ALTERATION PRICE.

BALL LOCK BUTTONS

COUNTER BORE RELIEF



R = P or G plus .030 min/.125 max

VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

CATALOG TYPE	BODY DIA D	DIE LAND B	MAX DIA R	ROUND	SHAPE		OVERALL LENGTH "L"
				RANGE P	MIN W	MAX G/P	
IB_50	.500	.187	.250	.064-.220	.064	.220	X
IB_62	.625	.187	.312	.118-.282	.064	.282	X
IB_75	.750	.250	.421	.128-.391	.095	.391	X
IB_87	.875	.312	.546	.191-.516	.127	.516	X
IB_100	1.000	.312	.687	.344-.657	.156	.657	X
IB_125	1.250*	.312	.843	.470-.813	.189	.813	X
IB_150	1.500*	.375	1.000	.629-.970	.250	.970	X
IB_175	1.750*	.375	1.093	.800-1.062	.464	1.062	X

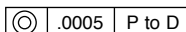
* D Tolerance -.0006 / -.0010

Material

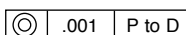
Steel: A2, HRC 58-60

Standard Point Tolerance

Round P +.0005
-.0000



Shape P, W +.001
-.000



ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" DIMENSIONS CODE

EXAMPLE: 7 IBO 100 .590 X .410

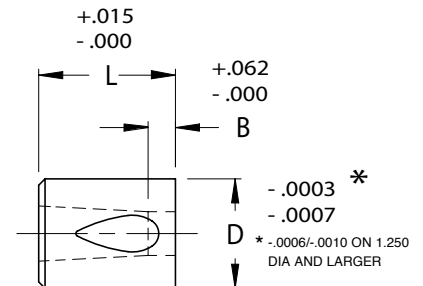
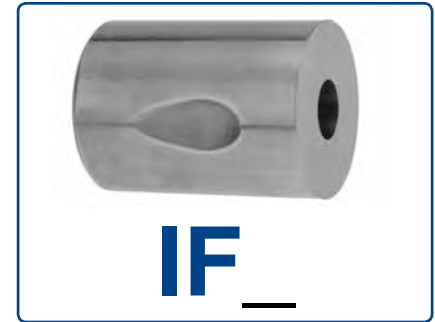
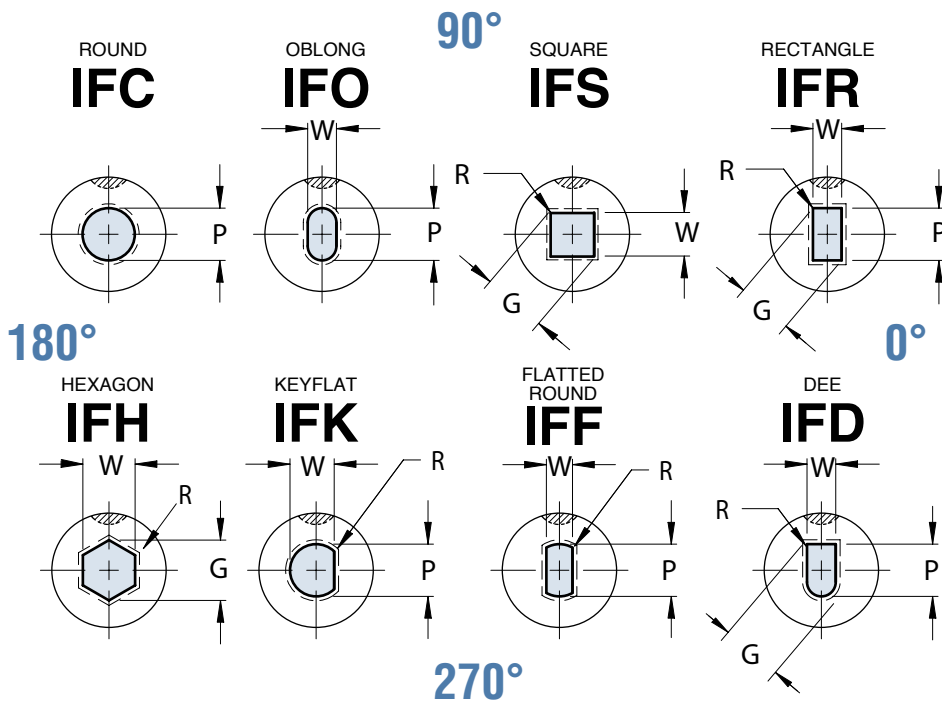
EXAMPLE: 2 IBH 75 .327

Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD BALL SEAT LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME ALTERATION PRICE.

BALL LOCK BUTTONS

ULTRA LIFE/TAPER RELIEF



FOR STANDARD ALTERATIONS SEE PAGES 63-68.
STANDARD TAPER: ROUND 1° PER SIDE/SHAPED 1-1/2° PER SIDE

VIEWS ARE SHOWN LOOKING AT TOP FACE OF BUTTON.

Complete design & CAD files visit WWW.MOELLERMCD.COM

CATALOG TYPE	BODY DIA D	LAND LENGTH "B"					ROUND	SHAPE		OVERALL LENGTH "L"
		NAPMA	ALTERNATES					MIN W	MAX G/P	
		STD	A	B	C	D	RANGE P			1.188
IF_50	.500	.188	.062	.125	.250	.375	.137-.220	.093	.220	X
IF_62	.625	.188	.062	.125	.312	.437	.137-.282	.093	.282	X
IF_75	.750	.250	.062	.125	.312	.437	.137-.391	.115	.391	X
IF_87	.875	.312	.062	.125	.375	.500	.275-.516	.125	.516	X
IF_100	1.000	.312	.062	.125	.375	.500	.359-.657	.156	.657	X
IF_125	1.250*	.312	.062	.125	.500	.625	.506-.813	.187	.813	X
IF_150	1.500*	.375	.062	.125	.500	.625	.617-.970	.250	.970	X
IF_175	1.750*	.375	.062	.125	.500	.625	.750-1.062	.250	1.062	X

* D Tolerance -.0006 / -.0010

Material

Steel: M2, HRC 60-63

Standard Point Tolerance

Round P $\begin{matrix} +.0005 \\ -.0000 \end{matrix}$.0005 P to D
Shape P,W $\begin{matrix} +.001 \\ -.000 \end{matrix}$.001 P to D

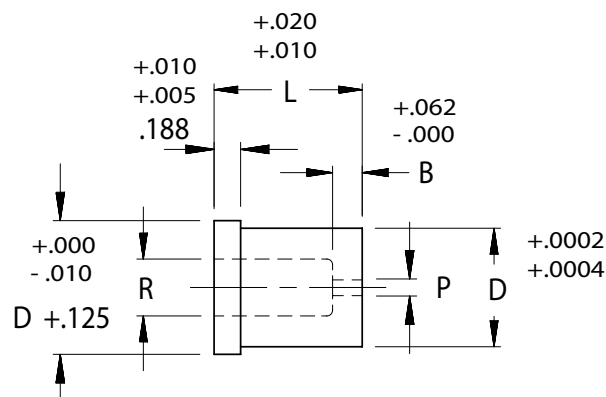
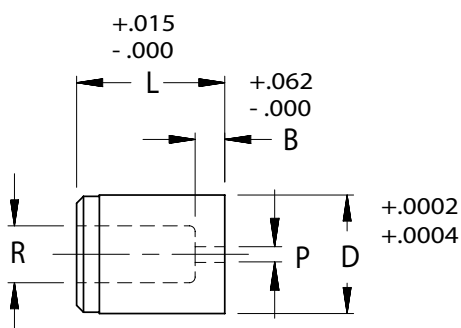
ORDER EXAMPLE:

(Reference page 4)
SPECIFY: QTY: TYPE "D" DIMENSIONS ALTERATION CODE
EXAMPLE: 4 IFO 100 .645 X .513 X3 = 1.187
EXAMPLE: 3 IFC 75 .382
Note: When ordering, standard quantity breaks are:
1, 2-3, 4-11, 12-23, 24-49, 50-99

STANDARD B/S LOCATION IS AT 90° AS SHOWN. AVAILABLE AT 0°, 180°, 270°, FOR SAME ALTERATION PRICE.

BUTTON BLANKS

PRESS FIT WITH COUNTER BORE RELIEF



Material

Steel: A2, HRC 58-60

FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	BODY DIA D	DIE LAND B	RLF DIA R	DRILL SIZE P	OVERALL LENGTH "L"						
					.750	.875	.937**	1.000	1.125	1.250	1.500
IDB 31	.3125*	.156	.188	.046	X	X	X	X	X	X	X
I_B 37	.3750	.156	.234	.046	X	X	X	X	X	X	X
IDB 43	.4375*	.156	.281	.046	X	X	X	X	X	X	X
I_B 50	.5000	.156	.328	.046	X	X	X	X	X	X	X
I_B 62	.6250	.188	.375	.078	X	X	X	X	X	X	X
I_B 75	.7500	.188	.468	.093	X	X	X	X	X	X	X
I_B 87	.8750	.188	.578	.093	X	X	X	X	X	X	X
I_B100	1.0000	.250	.687	.125	X	X	X	X	X	X	X
I_B125	1.2500	.312	.843	.125	X	X	X	X	X	X	X
IDB150	1.5000*	.312	1.093	.125	X	X	X	X	X	X	X

* Available IDB Only

**Not Available in IIB

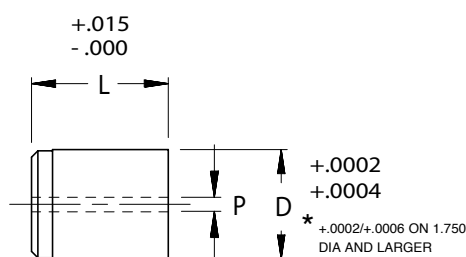
ORDER EXAMPLE:

(Reference page 4)

SPECIFY: QTY: TYPE "D" "L" ALTERATION CODE
EXAMPLE: 2 IDB 87 75 X2 = .745
EXAMPLE: 8 IIB 75 100

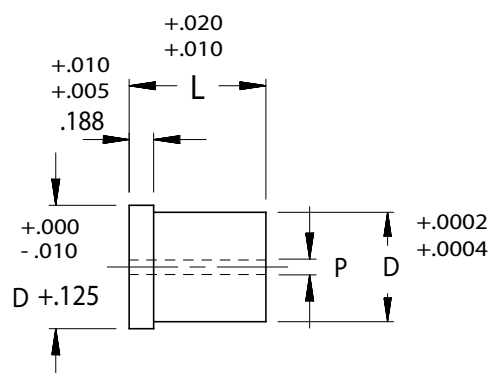
BUTTON BLANKS

PRESS FIT WITH STRAIGHT THRU HOLE



Material
Steel: M2, HRC 60-63

FOR STANDARD ALTERATIONS SEE PAGES 63-68.



ORDER EXAMPLE:

(Reference page 4)

SPECIFY:	QTY:	TYPE	"D"	"L"	ALTERATION CODE
EXAMPLE:	3	IUB	50	93	
EXAMPLE:	1	IMB	87	87	X2 = .810

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	BODY DIA D	DRILL SIZE P	OVERALL LENGTH "L"						
			.750**	.875	.937**	1.000	1.125	1.250	1.500
I_B 25	.2500	.046	X	X	X	X	X	X	X
I_B 31	.3125	.046	X	X	X	X	X	X	X
I_B 37	.3750	.046	X	X	X	X	X	X	X
I_B 43	.4375	.046	X	X	X	X	X	X	X
I_B 50	.5000	.046	X	X	X	X	X	X	X
I_B 62	.6250	.062	X	X	X	X	X	X	X
I_B 75	.7500	.093	X	X	X	X	X	X	X
I_B 87	.8750	.093	X	X	X	X	X	X	X
I_B100	1.0000	.093	X	X	X	X	X	X	X
I_B125	1.2500	.093	X	X	X	X	X	X	X
I_B150	1.5000	.093	X	X	X	X	X	X	X
IUB175	1.7500*	.093				X	X	X	X
IUB200	2.0000*	.093				X	X	X	X
IUB225	2.2500*	.093				X	X	X	X
IUB250	2.5000*	.093				X	X	X	X
IUB275	2.7500*	.093				X	X	X	X
IUB300	3.0000*	.093				X	X	X	X

*Available in IUB Only

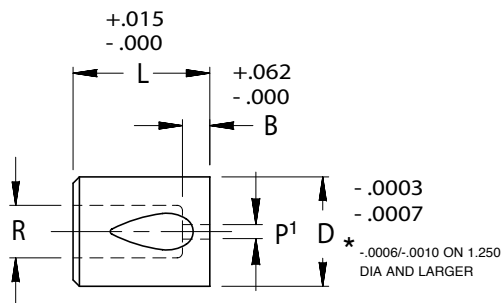
**Not Available in IMB

BUTTON BLANKS

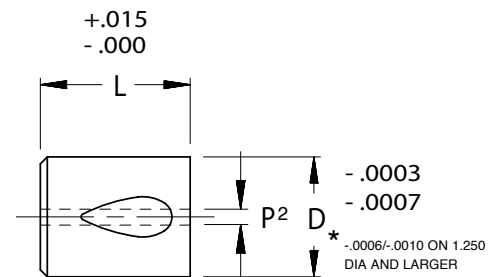
BALL LOCK WITH COUNTER BORE RELIEF AND STRAIGHT THRU HOLE



IBB



IFB



FOR STANDARD ALTERATIONS SEE PAGES 63-68.

Material

Steel: A2, HRC 58-60

Material

Steel: M2, HRC 60-63

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	BODY DIA D	DIE LAND B	RLF DIA R	DRILL SIZE P ¹	DRILL SIZE P ²	OVERALL LENGTH "L"
						1.188
I_B 50	.500	.188	.250	.046	.062	X
I_B 62	.625	.188	.312	.046	.062	X
I_B 75	.750	.250	.421	.046	.093	X
I_B 87	.875	.312	.546	.109	.093	X
I_B100	1.000	.312	.687	.125	.093	X
I_B125	1.250*	.312	.843	.171	.093	X
I_B150	1.500*	.375	1.000	.218	.093	X
I_B175	1.750*	.375	1.093	.437	.093	X

* D Tolerance -0.006 / -0.010

ORDER EXAMPLE:

(Reference page 4)

SPECIFY:	QTY:	TYPE	"D"	ALTERATION CODE
EXAMPLE:	6	IBB	62	
EXAMPLE:	3	IFB	50	X3 = 1.187

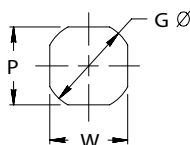
UNIVERSAL SHAPES

Views are shown looking through the shank of punch and top of button, as in true die position. Standard ballseat location is at 90°, standard flat location is at 0°. Points are centered on shanks unless noted by drawing. Female corners on buttons will be furnished with a .008 radius to facilitate wire EDM. To order the first character is I, then specify body type similar to other standard items, (second alpha characters), then "U" as the third alpha character. ADD an alteration code U-__ to describe universal shape.

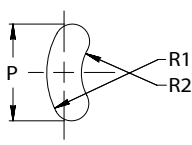
ORDER EXAMPLE: **I****H**U125-400 P=.975 W=.655 R=.060, U-17

MISCELLANEOUS

U-05

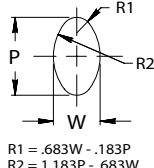


U-06

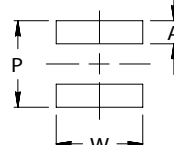


90°

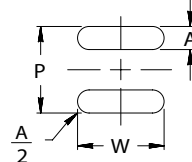
U-07



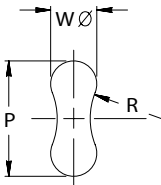
U-08



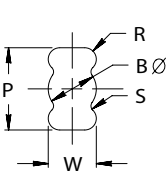
U-09



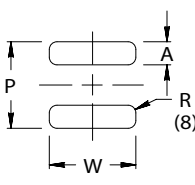
U-10



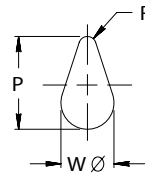
U-11



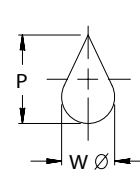
U-12



U-13

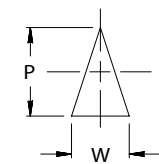


U-14

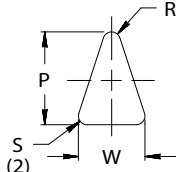


TRIANGLES/TRAPEZOIDS

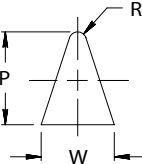
U-15



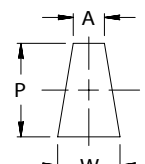
U-16



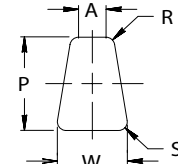
U-17



U-18



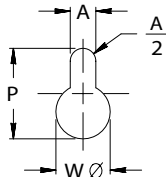
U-19



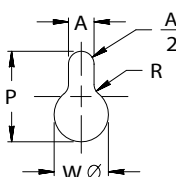
MONO LOBES

180°

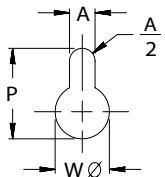
U-20



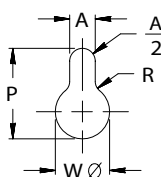
U-21



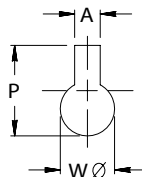
U-22



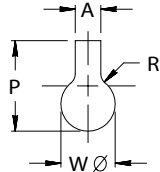
U-23



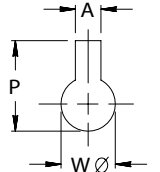
U-24



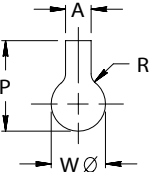
U-25



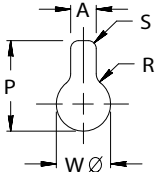
U-26



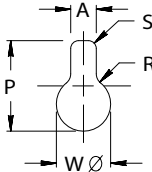
U-27



U-28

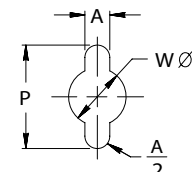


U-29

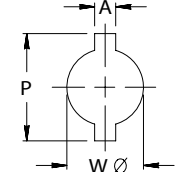


MULTI LOBES

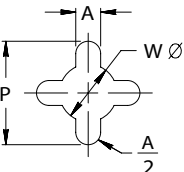
U-30



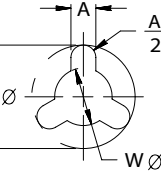
U-31



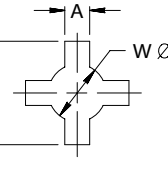
U-32



U-33



U-34



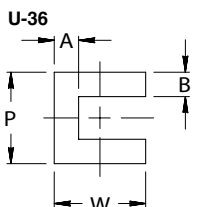
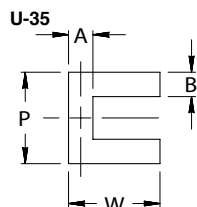
270°

UNIVERSAL SHAPES

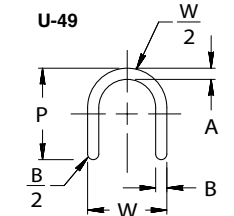
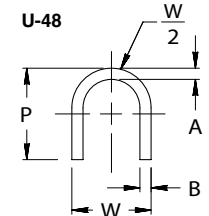
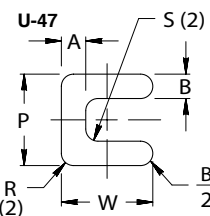
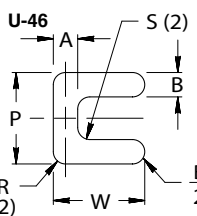
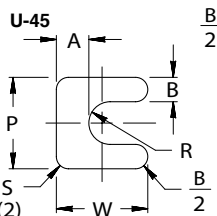
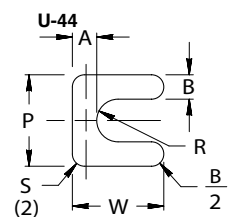
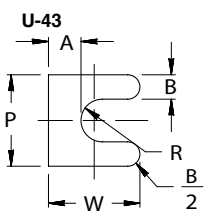
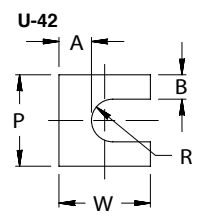
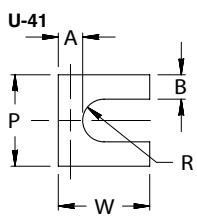
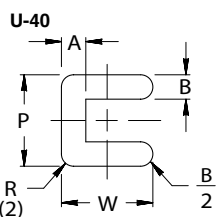
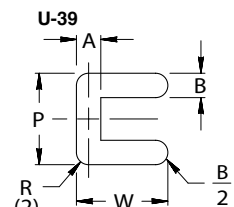
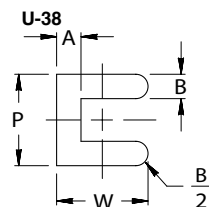
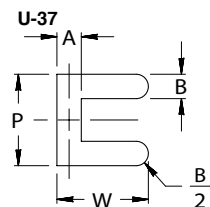
Views are shown looking through the shank of punch and top of button, as in true die position. Standard ballseat location is at 90°, standard flat location is at 0°. Points are centered on shanks unless noted by drawing. Female corners on buttons will be furnished with a .008 radius to facilitate wire EDM. To order, the first character is I, then specify body type similar to other standard items, (second alpha characters), then "U" as the third alpha character. ADD an alteration code U-__ to describe universal shape.

ORDER EXAMPLE: IHU125-400 P=.975 W=.655 B=.190 A=.190, U-38

U's

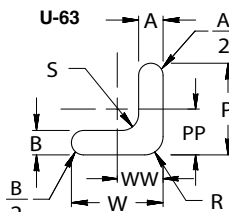
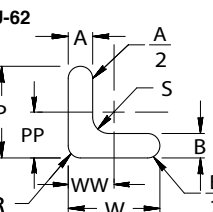
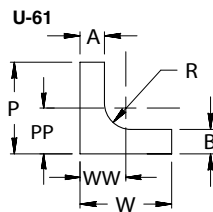
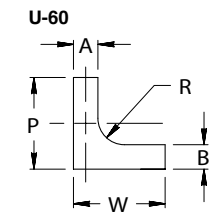
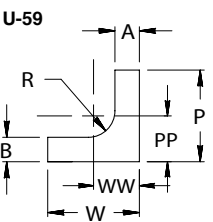
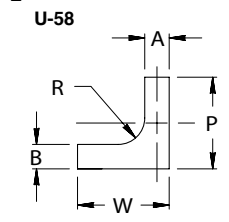
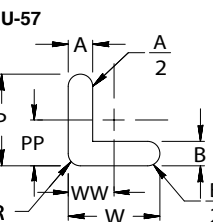
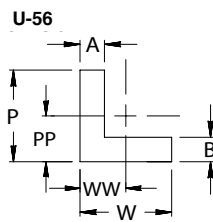
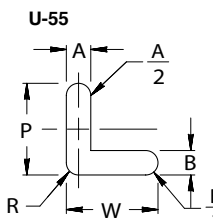
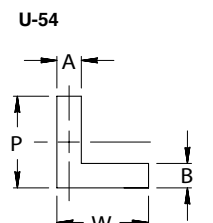
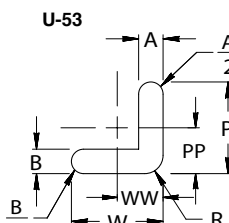
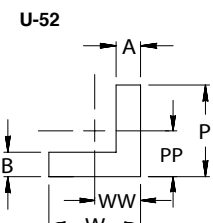
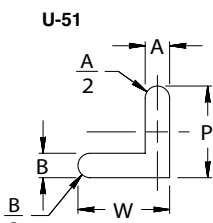
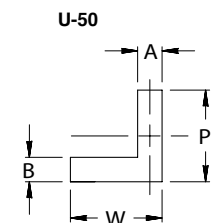


90°



L's

180°



0°

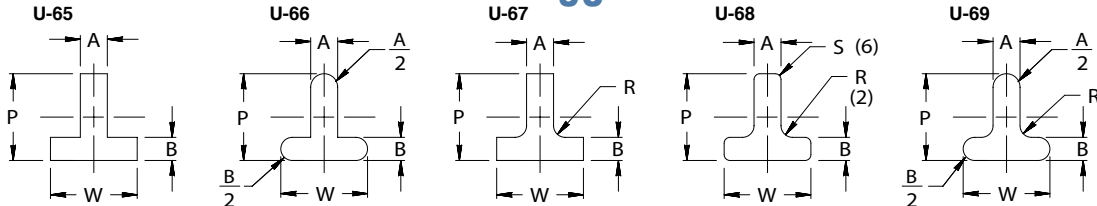
270°

UNIVERSAL SHAPES

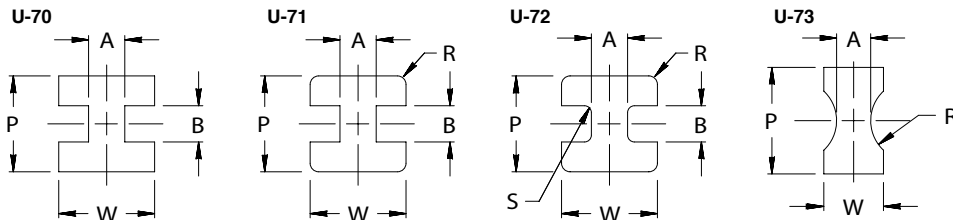
Views are shown looking through the shank of punch and top of button, as in true die position. Standard ballseat location is at 90°, standard flat location is at 0°. Points are centered on shanks unless noted by drawing. Female corners on buttons will be furnished with a .008 radius to facilitate wire EDM. To order, the first character is I, then specify body type similar to other standard items, (second alpha characters), then "U" as the third alpha character. ADD an alteration code U-__ to describe universal shape.

ORDER EXAMPLE: IHU100-400 P=.975 W=.655 R=.060, U-81

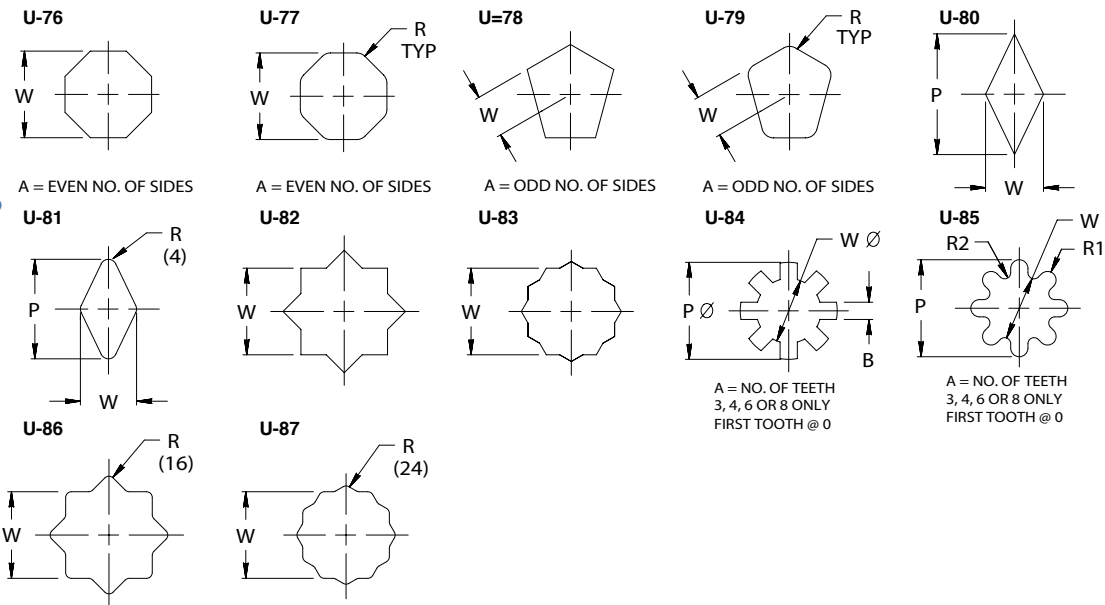
T's



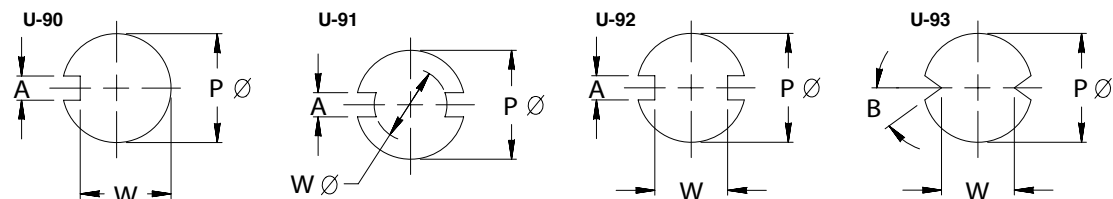
DUO TEES



POLYGONS

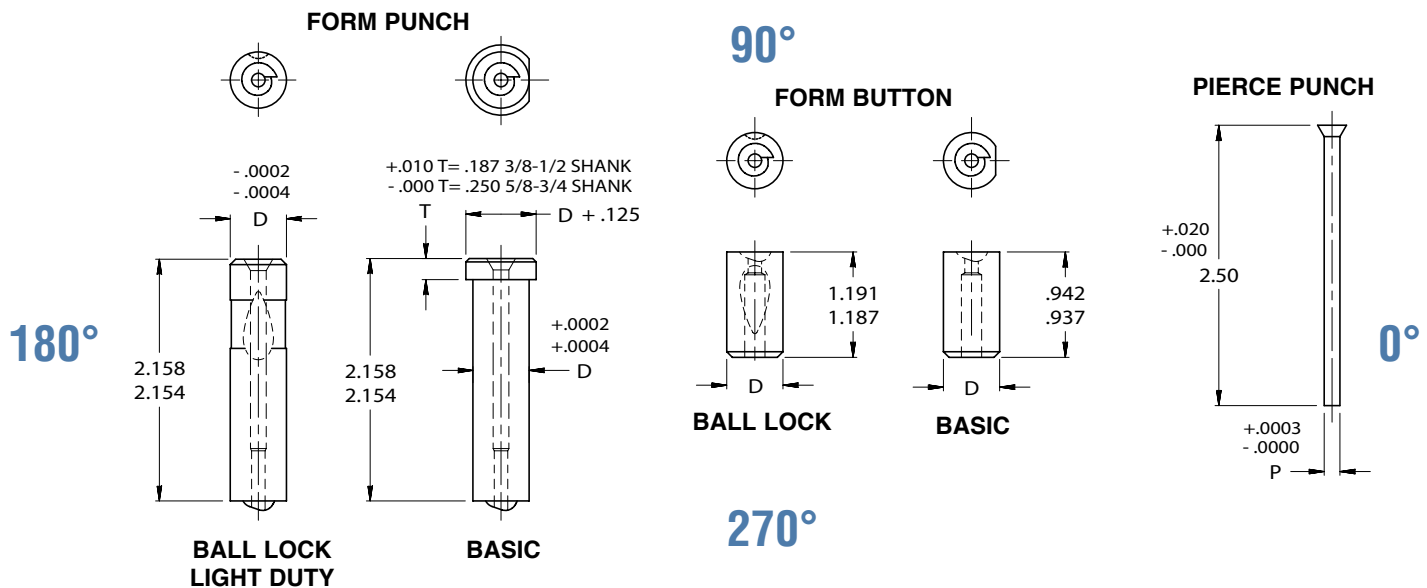


KEYS



270°

THREAD FORM TOOLING



PUNCH VIEWS ARE SHOWN LOOKING THROUGH THE SHANK BUT DRAWN WITH SOLID LINES FOR CLARITY. STANDARD FLAT LOCATION SHOWN ABOVE, FLAT AVAILABLE AS ALTERATION, SEE PAGE 64.

ORDER EXAMPLE:

(Reference page 4)

ALTERATION

SPECIFY: QTY: TYPE CODE

EXAMPLE: 2 ILQ-10BS

EXAMPLE: 3 IQQ-06C X1 = 2.35

Complete design & CAD files visit WWW.MOELLERMCAD.COM

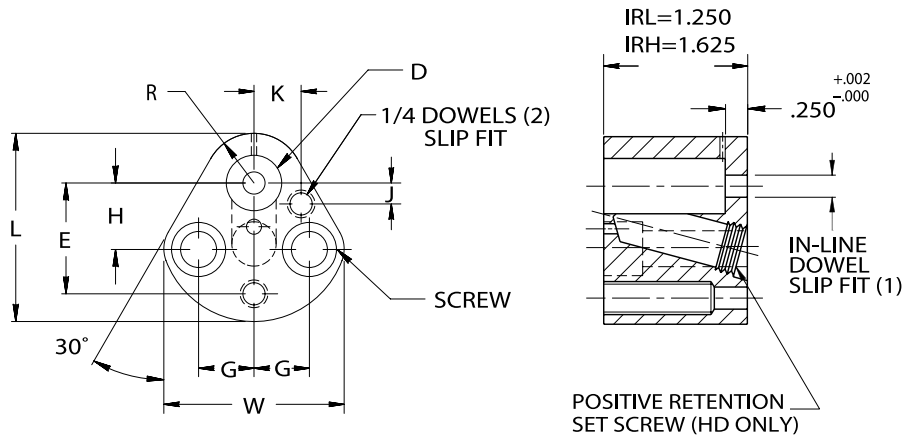
THREAD			FORM PUNCH		FORM BUTTON		PIERCE PUNCH	FORM SET		DIAMETER	
THREAD SIZE	SCREW TYPE	MATERIAL THICKNESS	BALL LOCK	BASIC	BALL LOCK	BASIC		BALL LOCK	BASIC	"D" DIA	"P" DIA
6-18	A	.020-.030	ILQ-06A	ISQ-06A	IBQ-06A	IDQ-06A	IQQ-06A	ILQ-06AS	ISQ-06AS	.375	.104
8-15	A	.025-.035	ILQ-08A	ISQ-08A	IBQ-08A	IDQ-08A	IQQ-08A	ILQ-08AS	ISQ-08AS	.500	.120
10-12	A	.030-.045	ILQ-10A	ISQ-10A	IBQ-10A	IDQ-10A	IQQ-10A	ILQ-10AS	ISQ-10AS	.500	.128
12-11	A	.035-.050	ILQ-12A	ISQ-12A	IBQ-12A	IDQ-12A	IQQ-12A	ILQ-12AS	ISQ-12AS	.625	.156
14-10	A	.035-.060	ILQ-14A	ISQ-14A	IBQ-14A	IDQ-14A	IQQ-14A	ILQ-14AS	ISQ-14AS	.625	.180
20-9	A	.050-.060	ILQ-20A	ISQ-20A	IBQ-20A	IDQ-20A	IQQ-20A	ILQ-20AS	ISQ-20AS	.750	.231
6-20	B/AB	.020-.030	ILQ-06B	ISQ-06B	IBQ-06B	IDQ-06B	IQQ-06B	ILQ-06BS	ISQ-06BS	.375	.107
8-18	B/AB	.020-.030	ILQ-08B	ISQ-08B	IBQ-08B	IDQ-08B	IQQ-08B	ILQ-08BS	ISQ-08BS	.500	.120
10-16	B/AB	.020-.030	ILQ-10B	ISQ-10B	IBQ-10B	IDQ-10B	IQQ-10B	ILQ-10BS	ISQ-10BS	.500	.138
12-14	B/AB	.030-.040	ILQ-12B	ISQ-12B	IBQ-12B	IDQ-12B	IQQ-12B	ILQ-12BS	ISQ-12BS	.625	.158
1/4-14	B/AB	.030-.040	ILQ-25B	ISQ-25B	IBQ-25B	IDQ-25B	IQQ-25B	ILQ-25BS	ISQ-25BS	.625	.188
5/16-12	B/AB	.030-.040	ILQ-31B	ISQ-31B	IBQ-31B	IDQ-31B	IQQ-31B	ILQ-31BS	ISQ-31BS	.750	.241
6-32	C	.010-.020	ILQ-06C	ISQ-06C	IBQ-06C	IDQ-06C	IQQ-06C	ILQ-06CS	ISQ-06CS	.375	.115
8-32	C	.010-.020	ILQ-08C	ISQ-08C	IBQ-08C	IDQ-08C	IQQ-08C	ILQ-08CS	ISQ-08CS	.500	.141
10-24	C	.015-.025	ILQ-10C	ISQ-10C	IBQ-10C	IDQ-10C	IQQ-10C	ILQ-10CS	ISQ-10CS	.500	.160
10-32	C	.010-.020	ILQ-10F	ISQ-10F	IBQ-10F	IDQ-10F	IQQ-10F	ILQ-10FS	ISQ-10FS	.625	.167
1/4-20	C	.020-.030	ILQ-25C	ISQ-25C	IBQ-25C	IDQ-25C	IQQ-25C	ILQ-25CS	ISQ-25CS	.625	.213
5/16-18	C	.020-.030	ILQ-31C	ISQ-31C	IBQ-31C	IDQ-31C	IQQ-31C	ILQ-31CS	ISQ-31CS	.750	.272



BALL LOCK RETAINERS



TRUE SET



Manufactured under Patent No.'s 0351395, 5357835
International Patents Pending.

FOR ACCESSORIES AND SHIM PLATES SEE PAGE 57-58.

Heavy Duty

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	D DIA.	L	W	R	H	±.0004 J	±.0004 K	G	±.0004 E	IN-LINE DOWEL	SCREW SIZE
IRH 37	.375	1.75	1.57	.38	.750	.2953	.3543	.438	1.060	.1875	5/16-18
IRH 50	.500	2.00	1.90	.50	.750	.2559	.4724	.562	1.180	.2500	3/8-16
IRH 62	.625	2.12	2.03	.56	.750	.2362	.5315	.625	1.250	.2500	3/8-16
IRH 75	.750	2.37	2.29	.69	.750	.1969	.6496	.688	1.320	.2500	3/8-16
IRH 87	.875	2.50	2.42	.75	.750	.1969	.7283	.688	1.400	.2500	3/8-16
IRH 100	1.000	2.75	2.62	.88	.938	.2756	.8661	.781	1.600	.2500	1/2-13
IRH 125	1.250	2.75	2.62	.88	.938	.2756	.8661	.781	1.600	.2500	1/2-13

Light Duty

Complete design & CAD files visit WWW.MOELLERMCAD.COM

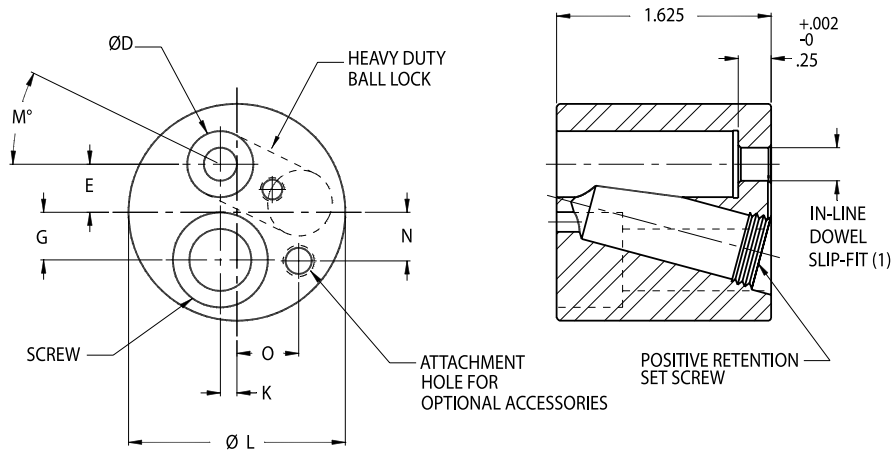
CATALOG NUMBER	D DIA.	L	W	R	H	±.0004 J	±.0004 K	G	±.0004 E	IN-LINE DOWEL	SCREW SIZE
IRL 25	.250	1.75	1.57	.38	.750	.2953	.3543	.438	1.060	.1250	5/16-18
IRL 37	.375	1.75	1.57	.38	.750	.2953	.3543	.438	1.060	.1875	5/16-18
IRL 50	.500	2.00	1.90	.50	.750	.2559	.4724	.562	1.180	.2500	3/8-16
IRL 62	.625	2.12	2.03	.56	.750	.2362	.5315	.625	1.250	.2500	3/8-16
IRL 75	.750	2.37	2.29	.69	.750	.1969	.6496	.688	1.320	.2500	3/8-16
IRL 87	.875	2.50	2.42	.75	.750	.1969	.7283	.688	1.400	.2500	3/8-16
IRL 100	1.000	2.75	2.62	.88	.938	.2756	.8661	.781	1.600	.2500	1/2-13
IRL 125	1.250	2.75	2.62	.88	.938	.2756	.8661	.781	1.600	.2500	1/2-13



BALL LOCK RETAINERS



ECONOMY ROUND TRUE SET HEAVY DUTY



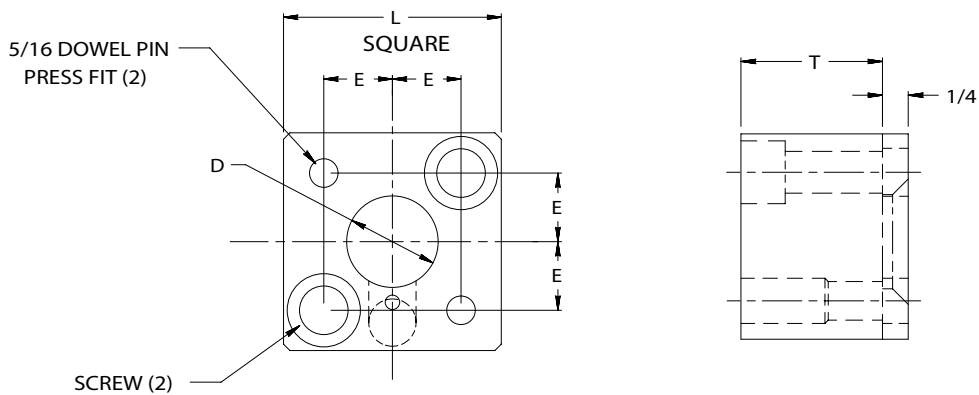
FOR ACCESSORIES SEE PAGE 57-58.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	$\varnothing D$	$\varnothing L$	E	G	$\pm .25^\circ$ M	K	SCREW SIZE	IN-LINE DOWEL
IRR 37	.375	1.50	.389	.280	20.5°	.104	7/16-14	.1875
IRR 50	.500	1.63	.364	.361	26°	.125	7/16-14	.2500
IRR 62	.625	1.75	.358	.436	33.5°	.076	7/16-14	.2500
IRR 75	.750	2.25	.480	.563	30°	0	5/8-11	.2500
IRR 87	.875	2.38	.484	.626	30°	0	5/8-11	.2500
IRR 100	1.000	2.50	.492	.689	30°	0	5/8-11	.2500
IRR 125	1.250	3.00	.617	.820	30°	0	3/4-10	.2500

BALL LOCK RETAINERS

SQUARE TYPE



FOR ACCESSORIES SEE PAGE 57-58.

NOTE: SCREW & DOWEL LOCATIONS $\pm .005$

Complete design & CAD files visit WWW.MOELLERMCAD.COM

Heavy Duty

CATALOG NUMBER	HOLE DIA. D	RETAINER SET	L	T	E	SCREW SIZE
IRS 37*	.375	X	—	—	—	—
IRS 50	.500	X	1.88	1.38	.562	3/8-16
IRS 62	.625	X	2.00	1.38	.625	3/8-16
IRS 75	.750	X	2.12	1.38	.687	3/8-16
IRS 87	.875	X	2.38	1.38	.750	1/2-13
IRS 100	1.000	X	2.38	1.38	.750	1/2-13
IRS 125	1.250	X	2.62	1.38	.812	1/2-13

*Consult Factory

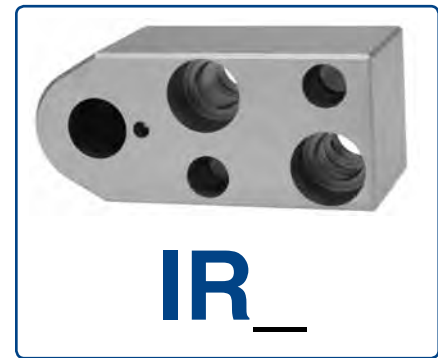
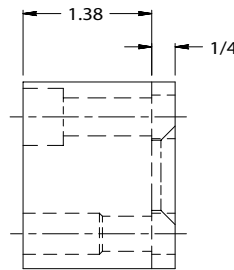
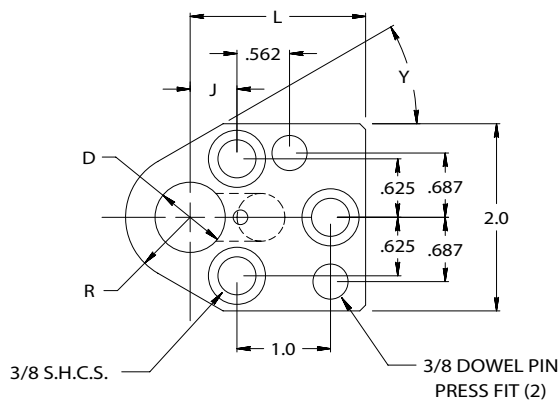
Light Duty

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	HOLE DIA. D	RETAINER SET	L	T	E	SCREW SIZE
IRF 25	.250	X	1.25	1.00	.312	1/4-20
IRF 37	.375	X	1.38	1.00	.375	5/16-18
IRF 50	.500	X	1.50	1.00	.437	5/16-18
IRF 62	.625	X	1.62	1.00	.500	5/16-18
IRF 75	.750	X	1.88	1.00	.562	3/8-16
IRF 87	.875	X	2.00	1.00	.625	3/8-16
IRF 100	1.000	X	2.25	1.00	.750	3/8-16
IRF 125	1.250	X	2.25	1.00	.750	3/8-16
IRF 150	1.500	X	2.75	1.00	1.000	3/8-16
IRF 175	1.750	X	2.75	1.00	1.000	3/8-16

BALL LOCK RETAINERS

END TYPE



FOR ACCESSORIES SEE PAGE 57-58.

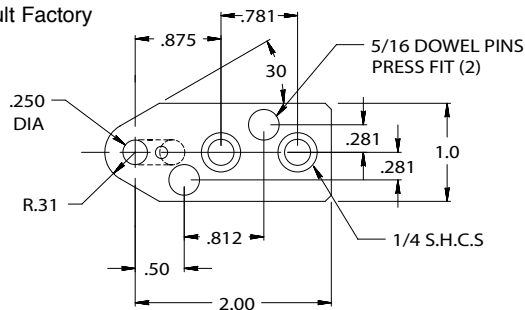
NOTE: SCREW & DOWEL LOCATIONS $\pm .005$

Heavy Duty

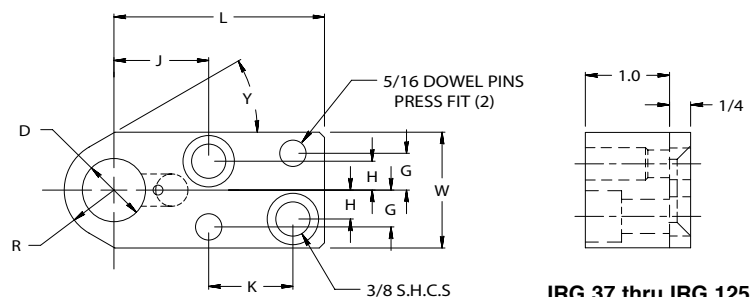
Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	HOLE DIA. D	RETAINER SET	L	R	J	Y
IRE 37*	.375	X	1.75	.62	.375	50°
IRE 50	.500	X	1.75	.50	.375	50°
IRE 62	.625	X	1.81	.56	.437	45°
IRE 75	.750	X	1.88	.69	.500	30°
IRE 87	.875	X	1.94	.75	.562	30°
IRE 100	1.000	X	2.00	.81	.625	30°
IRE 125	1.250	X	2.12	1.00	.750	—

*Consult Factory



IRG 25 Only



IRG 37 thru IRG 125

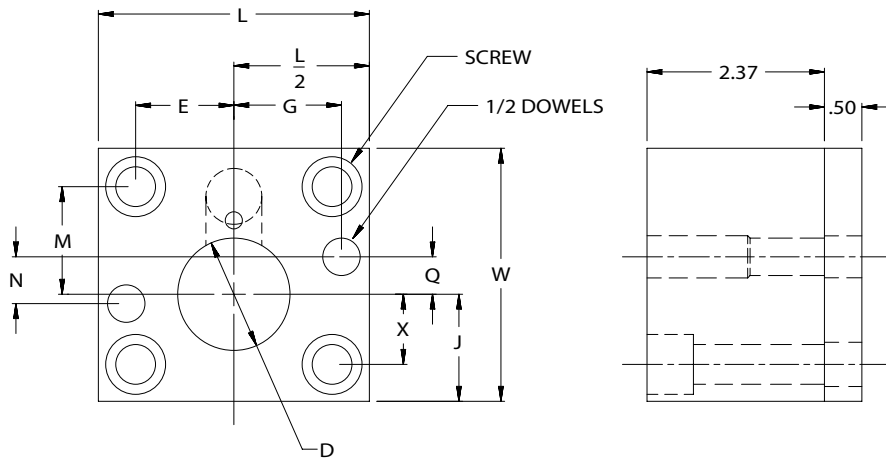
Light Duty

Complete design & CAD files visit WWW.MOELLERMCAD.COM

Catalog Number	Hole Dia. D	Retainer Set	W	L	R	Y	J	K	G	H
IRG 25	.250	X	1.00	2.00	.31	30°	.500	.812	.281	—
IRG 37	.375	X	1.25	2.25	.38	30°	.906	.968	.375	.281
IRG 50	.500	X	1.25	2.25	.56	30°	.906	.968	.375	.281
IRG 62	.625	X	1.25	2.25	.56	30°	.906	.968	.375	.281
IRG 75	.750	X	1.38	2.50	.68	—	1.125	1.000	.437	.343
IRG 87	.875	X	1.50	2.50	.75	—	1.125	1.000	.437	.343
IRG 100	1.000	X	1.62	2.50	.81	—	1.125	1.000	.437	.343
IRG 125	1.250	X	1.88	2.50	1.00	—	.875	1.125	.562	.562

BALL LOCK RETAINERS

EXTRA HEAVY DUTY



FOR ACCESSORIES SEE PAGE 57-58.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

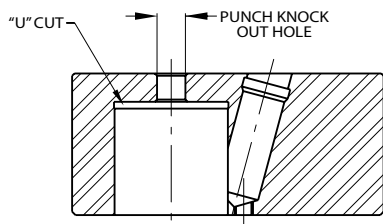
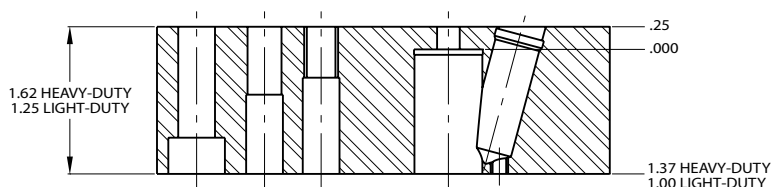
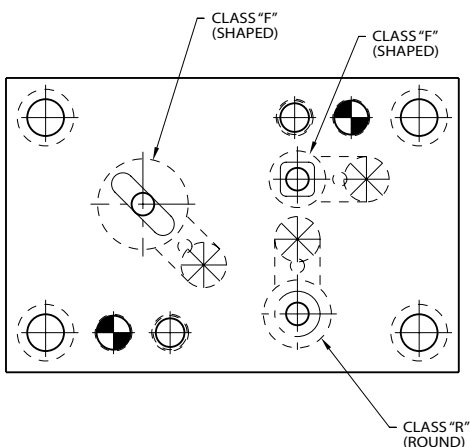
CATALOG NUMBER	HOLE DIA. D	W	L	J	E	M	X	G	Q	N	SCREW SIZE
IRX 100	1.000	2.87	3.12	1.18	1.062	1.187	.687	1.0625	.2500	.000	1/2-13
IRX 125	1.250	3.12	3.37	1.31	1.187	1.312	.812	1.1875	.3750	.2500	1/2-13
IRX 150	1.500	3.38	3.62	1.43	1.312	1.437	.937	1.3125	.5000	.5000	1/2-13
IRX 175	1.750	3.62	3.87	1.56	1.375	1.500	1.000	1.4375	.5625	.6250	5/8-11
IRX 200	2.000	3.87	4.12	1.68	1.500	1.625	1.125	1.5625	.6875	.8750	5/8-11
IRX 225	2.250	4.12	4.37	1.81	1.625	1.750	1.250	1.6875	.8125	1.1250	5/8-11
IRX 250	2.500	4.38	4.62	1.94	1.750	1.875	1.375	1.8125	.9375	1.3750	5/8-11

NOTE: P.O.R. NON-STOCKING ITEM.

SPECIAL MULTI HOLE BALL-LOCK RETAINERS

Shown below are examples of the two styles of Special Multi-Hole Ball Lock Retainers offered by Moeller Precision Tool. The True Set Style is Moeller's patented one piece construction, through hardened retainer. The conventional Backing Plate Style is supplied with a hardened Backing Plate attached by fasteners to the Retainer. All Ball Lock retainer punch or button holes must be designated as Round, class "R" or Shaped, class "F". Where shaped components are being used, the angle holes are precision ground. This guarantees radial location, but adds cost to the retainer. **Note: Ball-Seat class "R" will be supplied unless otherwise specified.**

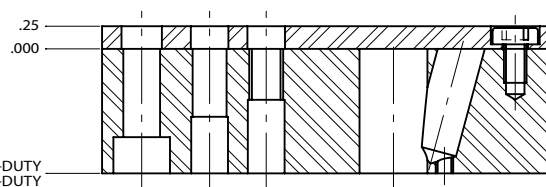
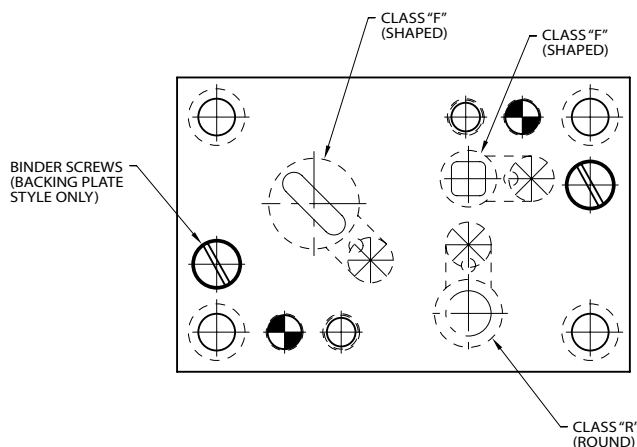
TRUE SET STYLE



DETAIL VIEW OF PUNCH HOLE SPECIAL FEATURES:

*AN EXCLUSIVE PATENTED MOELLER
PRODUCT PATENT NO.'s 0351395 & 5357835
INTERNATIONAL PATENT PENDING
*ONE-PIECE CONSTRUCTION-

BACKING PLATE STYLE



TOLERANCES ALL TYPES

OUTSIDE EDGES	± .020
DOWEL HOLE LOCATIONS	± .0005
SCREW HOLE LOCATIONS	± .005
COMPONENT HOLE LOCATIONS	± .0005

CLASS	BALL-HOLES	RADIAL TOL.
R		± 5°
F		± .0°5'



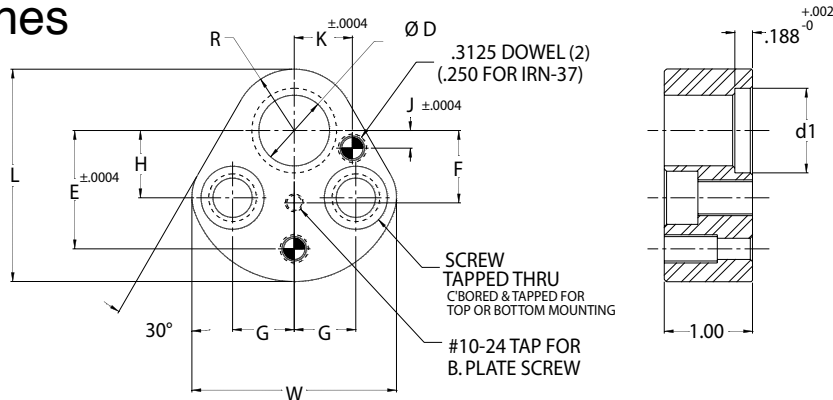
SHOULDER PUNCH RETAINERS



TRUE SET

IRN STYLE

For Round
Punches



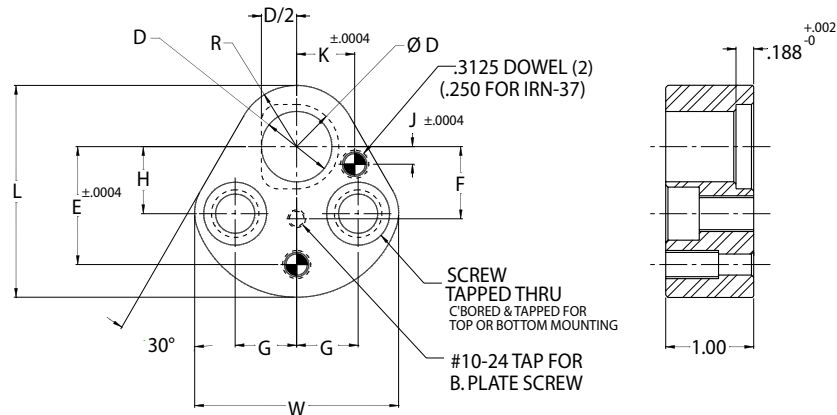
FOR ACCESSORIES AND BACKING PLATES
SEE PAGE 57-58.

Complete design & CAD files visit WWW.MOELLERMCAD.COM

CATALOG NUMBER	D	d1	L	W	R	H	$\pm .0004$ J	$\pm .0004$ K	G	$\pm .0004$ E	F	SCREW SIZE	TAP
IRN 37	.375	.53	1.75	1.57	.38	.75	.2953	.3543	.438	1.060	.63	5/16-18	3/8-16
IRN 50	.500	.66	2.00	1.90	.50	.75	.2559	.4724	.562	1.180	.63	5/16-18	3/8-16
IRN 62	.625	.78	2.12	2.03	.56	.75	.2362	.5315	.625	1.250	.63	5/16-18	3/8-16
IRN 75	.750	.91	2.37	2.29	.69	.75	.1968	.6496	.688	1.320	.91	5/16-18	3/8-16
IRN 100	1.000	1.18	2.75	2.62	.88	.94	.2756	.8661	.781	1.600	1.18	1/2-13	5/8-11
IRN 125	1.250	1.41	2.75	2.62	.88	.94	.2756	.8661	.781	1.600	1.18	1/2-13	5/8-11

IRO STYLE

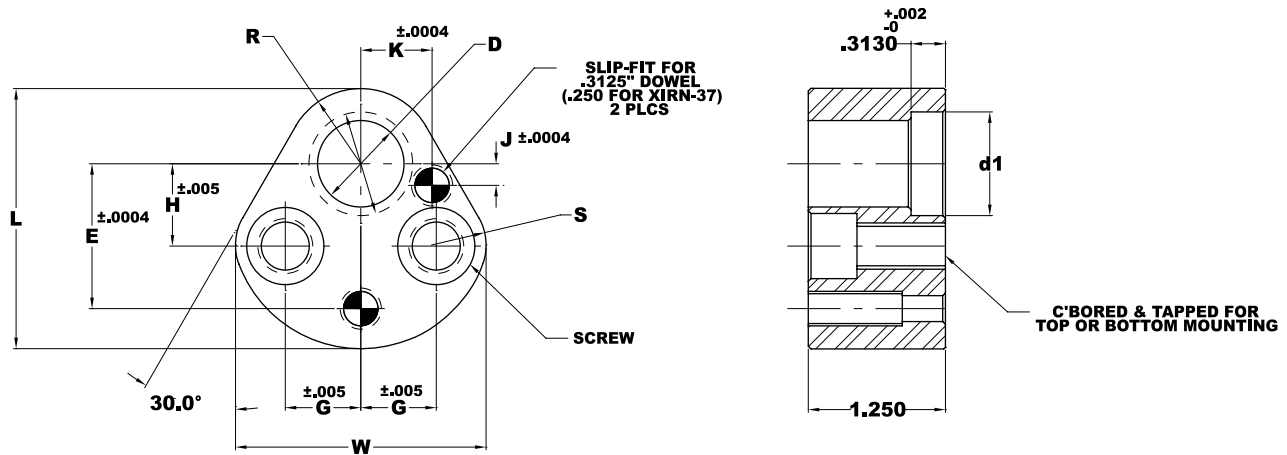
For Shaped
Punches



Complete design & CAD files visit WWW.MOELLERMCAD.COM

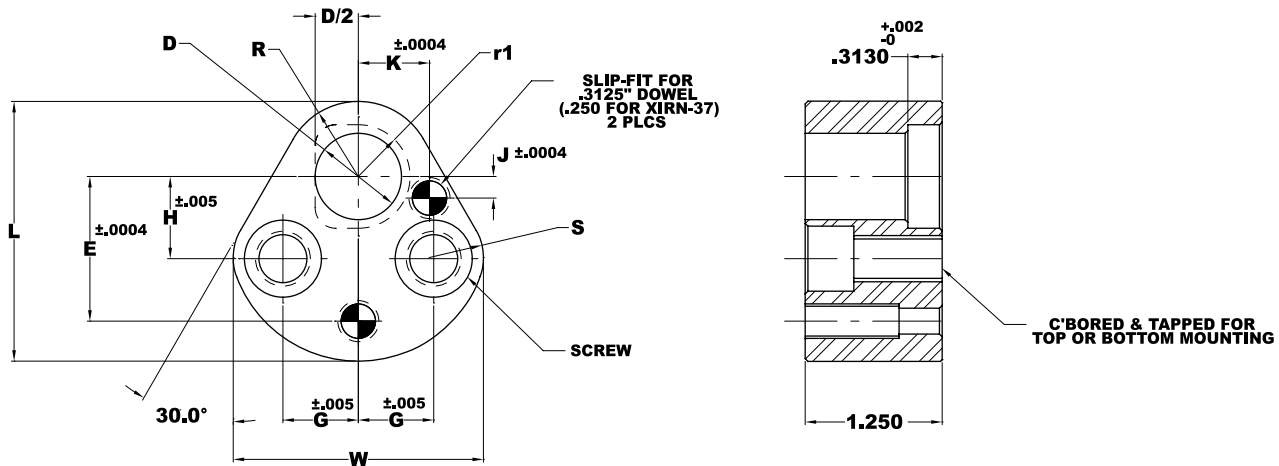
CATALOG NUMBER	D	r1	L	W	R	H	$\pm .0004$ J	$\pm .0004$ K	G	$\pm .0004$ E	F	SCREW SIZE	TAP
IRO 37	.375	.53	1.75	1.57	.38	.75	.2953	.3543	.438	1.060	.63	5/16-18	3/8-16
IRO 50	.500	.66	2.00	1.90	.50	.75	.2559	.4724	.562	1.180	.63	5/16-18	3/8-16
IRO 62	.625	.78	2.12	2.03	.56	.75	.2362	.5315	.625	1.250	.63	5/16-18	3/8-16
IRO 75	.750	.91	2.37	2.29	.69	.75	.1968	.6496	.688	1.320	.91	5/16-18	3/8-16
IRO 100	1.000	1.18	2.75	2.62	.88	.94	.2756	.8661	.781	1.600	1.18	1/2-13	5/8-11
IRO 125	1.250	1.41	2.75	2.62	.88	.94	.2756	.8661	.781	1.600	1.18	1/2-13	5/8-11

XIRN STYLE FOR ROUND PUNCHES



PART NUMBER	D	d1	L	W	R	H	J	K	S	G	E	SCREW SIZE	TAPPED HOLE
XIRN-37	.375	.59	1.75	1.72	.38	.75	.2953	.3543	.47	.438	1.060	5/16-18	3/8-16
XIRN-50	.500	.72	2.00	1.97	.50	.75	.2559	.4724	.60	.563	1.180	5/16-18	3/8-16
XIRN-62	.625	.84	2.12	2.09	.56	.75	.2362	.5315	.66	.625	1.25	5/16-18	3/8-16
XIRN-75	.750	.97	2.37	2.34	.69	.75	.1968	.6496	.79	.688	1.320	5/16-18	3/8-16
XIRN-87	.875	1.09	2.50	2.47	.75	.75	.1970	.7284	.85	.688	1.400	5/16-18	3/8-16
XIRN-100	1.00	1.22	2.75	2.72	.88	.938	.2756	.8661	.97	.781	1.600	1/2-13	5/8-11

XIRO STYLE FOR SHAPED PUNCHES



PART NUMBER	D	r1	L	W	R	H	J	K	S	G	E	SCREW SIZE	TAPPED HOLE
XIRO-37	.375	.296	1.75	1.72	.38	.75	.2953	.3543	.47	.438	1.060	5/16-18	3/8-16
XIRO-50	.500	.359	2.00	1.97	.50	.75	.2559	.4724	.60	.563	1.180	5/16-18	3/8-16
XIRO-62	.625	.422	2.12	2.09	.56	.75	.2362	.5315	.66	.625	1.25	5/16-18	3/8-16
XIRO-75	.750	.484	2.37	2.34	.69	.75	.1968	.6496	.79	.688	1.320	5/16-18	3/8-16
XIRO-87	.875	.546	2.50	2.47	.75	.75	.1970	.7284	.85	.688	1.400	5/16-18	3/8-16
XIRO-100	1.00	.609	2.75	2.72	.88	.938	.2756	.8661	.97	.781	1.600	1/2-13	5/8-11

RETAINER COMPONENTS



TRUE SET RETAINER COMPONENTS

TRUE SET RETAINER		SOC. HD. CAP SCREW	DOWELS	BALL	SPRING	BALL RELEASE SCREW	ANGLE HOLE SET SCREW		
HEAVY DUTY	IRH 37	IAC 31-175 5/16-18 x 1-3/4	IAD 18-75 3/16 x 3/4	IAB 37 3/8 DIA.	IAS 37T 3/8 DIA. H.D.	IAC 10-100 10-24 x 1	IAN 37		
	IRH 50	IAC 37-200 3/8-16 x 2	IAD 25-75 1/4 x 3/4	IAB 50 1/2 DIA.	IAS 50T 1/2 DIA.		IAN 50		
	IRH 62								
	IRH 75								
	IRH 87								
	IRH 100	IAC 50-200 1/2 - 13 x 2							
	IRH-125								
LIGHT DUTY	IRL 25	IAC 31-150 5/16-18 x 1-1/2	IAD 12-75 1/8 x 3/4	IAB 25 1/4 DIA.	IAS 25 1/4 DIA.	IAC 08-100 8-32 x 1			
	IRL 37		IAD 18-75 3/16 x 3/4						
	IRL 50	IAC 37-150 3/8-16 x 1-1/2	IAD 25-75 1/4 x 3/4	IAB 31 5/16 DIA.	IAS 31 5/16 DIA.				
	IRL 62			IAB 37 3/8 DIA.	IAS 37 3/8 DIA. L.D.				
	IRL 75								
	IRL 87								
	IRL 100	IAC 50-175 1/2-13 x 1-3/4							
	IRL 125								

SPECIAL BACKING PLATE RETAINER COMPONENTS

	SPRINGS	BALLS
1/4 DIA.	IAS 25S	IAB 25
5/16 DIA.	IAS 31S	IAB 31
3/8 DIA.	IAS 37S	IAB 37
1/2 DIA.	IAS 50S	IAB 50

EXTRA HEAVY DUTY BALL LOCK RETAINER COMPONENTS

3/4 DIA SPRING	IAS 75
3/4 DIA BALL	IAB 75

BOOSTER SPRINGS

	PUNCH SIZE .375 HDBL CATALOG # IAS037B
	PUNCH SIZE .500 THRU 1.250 HDBL CATALOG # IAS050B

ECONOMY ROUND TRUE SET RETAINER COMPONENTS

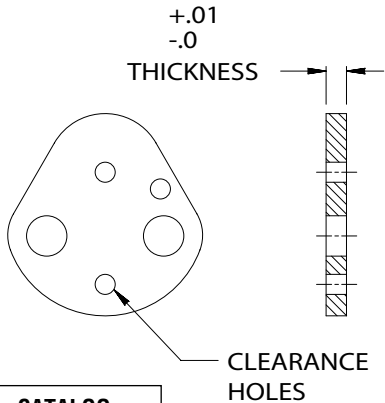
TRUE SET ROUND RETAINER	SOC. HD. CAP SCREW	DOWELS	BALL	SPRING	BALL RELEASE SCREW	ANGLE HOLE SET SCREW
IRR 37	IAC43-175 TL 7/16"-14 x 1.75	IAD 18-75 3/16 X 3/4	IAB 37 3/8 DIA.	IAS 37T 3/8 DIA. H.D.	IAC 10-100 10-24 x 1	IAN 37
IRR 50		IAD 25-75 1/4 x 3/4	IAB 50 1/2 DIA.	IAS 50T 1/2 DIA. H.D.		IAN 50
IRR 62						
IRR 75	IAC62-200 TL 5/8"-11 x 2.0 LONG					
IRR 87						
IRR 100						
IRR 125	IAC75-200 TL 3/4"-10 x 2.0 LONG					

SHOULDER TRUE SET RETAINER COMPONENTS

TRUE SET ROUND RETAINER	S.H.C.S	DOWELS	TRUE SET ROUND RETAINER	S.H.C.S	DOWELS		
IRN-37	IAC31-150 5/16-18 X 1.50	IAD25-75 .250 X .75	IRO-37	IAC31-150 5/16-18 X 1.50	IAD25-75 .250 X .75		
IRN-50			IRO-50				
IRN-62		IAD31-150 .3125 X 1.50	IRO-62		IAD31-150 .3125 X 1.50		
IRN-75			IRO-75				
IRN-100	IAC50-175 1/2-13 X 1.75		IRO-100	IAC50-175 1/2-13 X 1.75			
IRN-125			IRO-125				

RETAINER ACCESSORIES

TRUE SET SHIM PLATES



THICKNESS $\begin{matrix} +.01 \\ -.0 \end{matrix}$

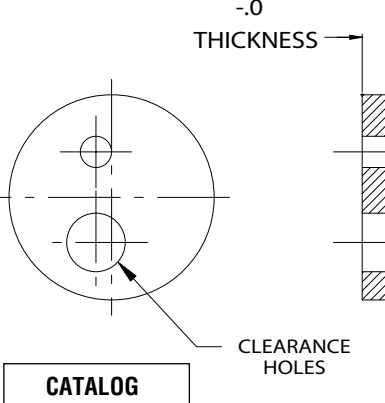
CLEARANCE HOLES

Available Thickness	Ordering Number
.071	071
.118	118
.125	125
.187	187
.236	236
.250	250
.394	394
.512	512

INSERT SHIM THICKNESS

ORDERING EXAMPLE
IAX 50-236

CATALOG NUMBER
IAX 25-
IAX 37-
IAX 50-
IAX 62-
IAX 75-
IAX 87-
IAX 100-
IAX 125-



THICKNESS $\begin{matrix} +.01 \\ -.0 \end{matrix}$

CLEARANCE HOLES

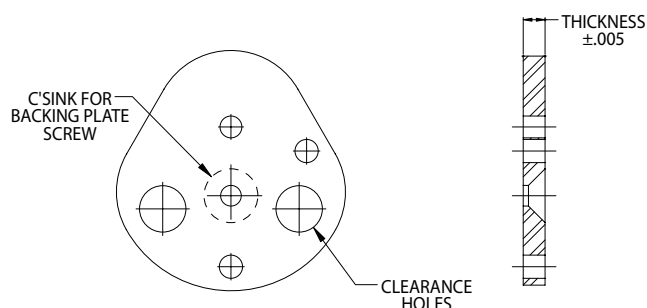
Available Thickness	Ordering Number
.071	071
.118	118
.125	125
.187	187
.236	236
.250	250
.394	394
.512	512

INSERT SHIM THICKNESS

ORDERING EXAMPLE
IAY 50-236

CATALOG NUMBER
IAY 37-
IAY 50-
IAY 62-
IAY 75-
IAY 87-
IAY 100-
IAY 125-

TRUE SET SHOULDER RETAINER BACKING PLATES



CATALOG NUMBER	Available Thickness	Ordering Number
IAW 37-	.188	188
IAW 50-	.250	250
IAW 62-		
IAW 75-		
IAW 100-		
IAW 125-		

INSERT BACKING PLATE THICKNESS

HARDENED TO R/C 50-52

ORDERING EXAMPLE
IAW 50-188

BALL RELEASE TOOLS

ANGLE TIP

(for all Retainers)

Cat.. No. IAT 01



STRAIGHT TIP

(for all Retainers)

Cat. No. IAT 02



THREADED TIP HEAVY DUTY

(for True Set Retainers)

Cat. No. IAT 03



THREADED TIP LIGHT DUTY

(for True Set Retainers)

Cat. No. IAT 04



ANGLE HOLE SET SCREW TOOL

(for True Set Retainers)

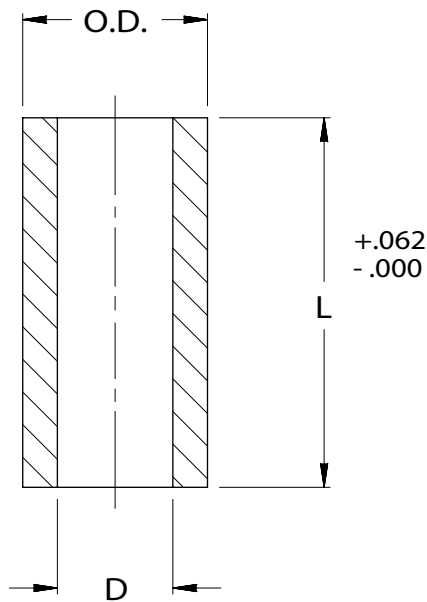
Cat. No. IAO 01



URETHANE STRIPPERS

OPEN END

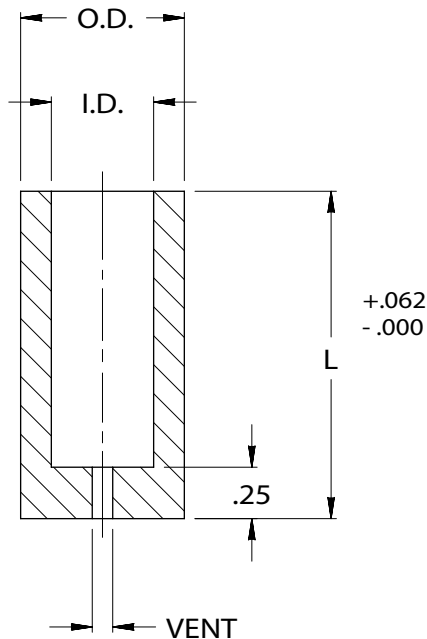
- “D” INSIDE DIAMETER PROVIDES RING FIT WITH PUNCH SHANK OR DOWEL DIAMETER
- DUROMETER 90 SHORE A



CATALOG NO.	FITS PUNCH SHANK D	OUTSIDE DIA. O.D.	OVER-ALL LGTH. L.	LOAD-POUNDS TO DEFLECT SPRINGS			
				.125	.250	.375	.500
ITO 18-125	.1875	.687	1.25	125	230	400	—
ITO 18-150			1.50	120	225	390	—
ITO 18-1200			12.00	—	—	—	—
ITO 25-125	.250	.750	1.25	135	250	420	—
ITO 25-150			1.50	130	240	380	—
ITO 25-175			1.75	125	230	345	—
ITO 25-200			2.00	115	215	300	—
ITO 25-1200			12.00	—	—	—	—
ITO 31-125	.3125	.812	1.25	160	300	500	—
ITO 31-150			1.50	150	280	445	—
ITO 31-175			1.75	140	260	390	—
ITO 31-200			2.00	135	240	350	—
ITO 31-1200			12.00	—	—	—	—
ITO 37-125	.375	.875	1.25	170	320	510	—
ITO 37-150			1.50	160	310	475	—
ITO 37-175			1.75	150	200	480	—
ITO 37-200			2.00	140	260	390	—
ITO 37-1200			12.00	—	—	—	—
ITO 50-125	.500	1.000	1.25	205	370	550	—
ITO 50-150			1.50	195	355	520	—
ITO 50-175			1.75	180	335	480	—
ITO 50-200			2.00	165	305	440	—
ITO 50-225			2.25	150	270	395	520
ITO 50-1200			12.00	—	—	—	—
ITO 62-125	.625	1.125	1.25	240	420	610	—
ITO 62-150			1.50	235	410	600	—
ITO 62-175			1.75	230	400	590	—
ITO 62-200			2.00	225	390	575	—
ITO 62-225			2.25	220	375	550	790
ITO 62-1200			12.00	—	—	—	—
ITO 75-150	.750	1.375	1.50	380	675	950	—
ITO 75-175			1.75	360	645	920	—
ITO 75-200			2.00	340	610	885	—
ITO 75-225			2.25	320	575	810	1150
ITO 75-250			2.50	275	525	735	1070
ITO 75-275			2.75	240	475	670	980
ITO 75-300			3.00	210	410	600	875
ITO 75-1200			12.00	—	—	—	—
ITO 87-150	.875	1.625	1.50	480	870	1260	—
ITO 87-175			1.75	470	850	1240	—
ITO 87-200			2.00	450	850	1210	—
ITO 87-225			2.25	440	800	1175	1660
ITO 87-250			2.50	425	770	1120	1600
ITO 87-275			2.75	410	740	1075	1525
ITO 87-300			3.00	395	705	1025	1430
ITO 87-1200			12.00	—	—	—	—
ITO 100-150	1.000	1.750	1.50	570	980	1400	—
ITO 100-175			1.75	550	970	1385	—
ITO 100-200			2.00	530	955	1370	—
ITO 100-225			2.25	510	930	1345	1850
ITO 100-250			2.50	485	900	1315	1800
ITO 100-275			2.75	465	865	1275	1745
ITO 100-300			3.00	440	820	1235	1675
ITO 100-1200			12.00	—	—	—	—

URETHANE STRIPPERS

CLOSED END



VENT	I.D.'s
.062	.187-.250
.093	.312
.125	.375-1.00

CLOSED END urethane strippers are shaped to suit the punch point by closing the die – without the material – the point and the die cavity provide the shearing action to shape the closed end.

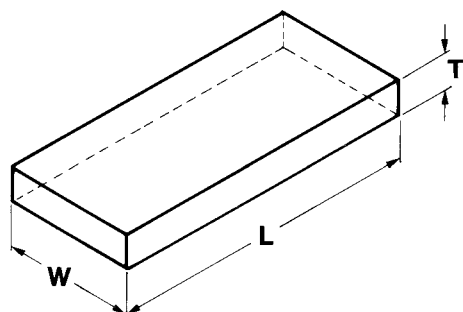
Urethane provides an excellent balance of load bearing and memory rate, with a tensile strength of 6800 P.S.I., deflections greater than 25% are not recommended; for optimum life in high speed continuous operations, a 15% deflection is suggested.

Durometer hardness 95 Shore A.

CATALOG #	I.D.	O.D.	LENGTH L	APPROXIMATE PRESSURE AVAILABLE AT DEFLECTION OF		
				.125	.250	.375
ITC 18-125	.187	.687	1.25	275	440	—
ITC 18-150			1.50	250	400	—
ITC 18-175			1.75	225	375	—
ITC 25-125	.250	.750	1.25	310	500	—
ITC 25-150			1.50	300	490	—
ITC 25-175			1.75	250	400	520
ITC 25-200			2.00	240	380	510
ITC 31-125	.312	.812	1.25	350	540	—
ITC 31-150			1.50	325	475	—
ITC 31-175			1.75	320	450	720
ITC 31-200			2.00	260	390	600
ITC 31-225			2.25	230	370	590
ITC 37-125	.375	.875	1.25	470	725	—
ITC 37-150			1.50	420	700	—
ITC 37-175			1.75	390	640	775
ITC 37-200			2.00	360	580	700
ITC 37-225			2.25	330	520	680
ITC 50-125	.500	1.000	1.25	575	830	—
ITC 50-150			1.50	510	780	—
ITC 50-175			1.75	480	720	940
ITC 50-200			2.00	370	560	685
ITC 50-225			2.25	320	520	640
ITC 50-250	.625	1.125	2.50	300	480	600
ITC 62-125			1.25	670	970	—
ITC 62-150			1.50	565	885	—
ITC 62-175			1.75	530	830	1040
ITC 62-200			2.00	480	780	980
ITC 62-225	.750	1.500	2.25	440	720	900
ITC 75-175			1.75	560	860	1260
ITC 75-200			2.00	450	750	1100
ITC 75-225			2.25	390	690	1050
ITC 75-250			2.50	350	650	1000
ITC 75-275	.875	1.750	2.75	340	640	950
ITC 75-300			3.00	320	510	820
ITC 87-175			1.75	1600	2300	3500
ITC 87-200			2.00	1350	2050	3000
ITC 87-225			2.25	1325	2025	2700
ITC 87-250	1.000	2.000	2.50	1000	1700	2100
ITC 87-275			2.75	950	1650	1950
ITC 87-300			3.00	850	1450	1850
ITC 100-175			1.75	2100	3100	3600
ITC 100-200			2.00	1750	2700	3500
ITC 100-225	1.000	2.000	2.25	1550	2400	3300
ITC 100-250			2.50	1350	2100	3100
ITC 100-275			2.75	1100	1900	2900
ITC 100-300			3.00	950	1500	2400

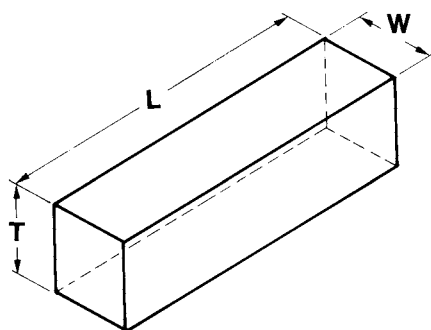
SHEETS/BARS/RODS/SPECIALS

URETHANE SHEETS



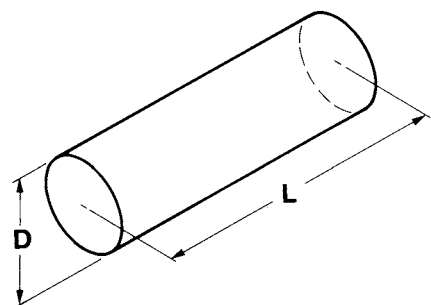
WIDTH LENGTH	THICKNESS								
	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
6 x 6	X	X	X	X	X	X	X	X	X
6 x 12	X	X	X	X	X	X	X	X	X
6 x 18	X	X	X	X	X	X	X	X	X
6 x 24	X	X	X	X	X	X	X	X	X
12 x 12	X	X	X	X	X	X	X	X	X
12 x 18	X	X	X	X	X	X	X	X	X
12 x 24	X	X	X	X	X	X	X	X	X
18 x 18	X	X	X	X	X	X	X	X	X
18 x 24	X	X	X	X	X	X	X	X	X
24 x 24	X	X	X	X	X	X	X	X	X

URETHANE BARS



WIDTH THICKNESS	LENGTH			
	12	24	36	48
1 x 1	X	X	X	X
1 x 2	X	X	X	X
1 x 3	X	X	X	X
1 x 4	X	X	X	X
2 x 2	X	X	X	X
2 x 3	X	X	X	X
2 x 4	X	X	X	X
3 x 3	X	X	X	X
3 x 4	X	X	X	X
4 x 4	X	X	X	X

URETHANE RODS



DIA.	LENGTH	
	12	24
3/8	X	X
1/2	X	X
5/8	X	X
3/4	X	X
7/8	X	X
1	X	X
1 1/8	X	X
1 1/4	X	X
1 3/8	X	X
1 1/2	X	X

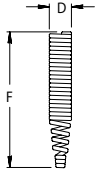
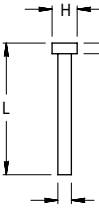
DIA.	LENGTH	
	12	24
1 3/4	X	X
2	X	X
2 1/4	X	X
2 1/2	X	X
2 3/4	X	X
3	X	X
3	X	X
4	X	X
4 1/2	X	X
5	X	X

EJECTOR COMPONENTS

EJECTOR COMPONENT SPECIFICATIONS

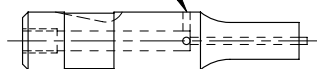
SHANK DIA. D	EJECTOR SPECIFICATION	DRILL PIN HOLE	SIZE SPRING HOLE	SCREW SIZE	CROSS HOLE SIZE	PIN EXTENSION
.1875 ALL	IAE 2	#72 (.025)	#44 (.086)	#3-48	.032	.032±.010
.2500 ALL	IAE 3	#1/32 (.031)	7/64 (.109)	#5-40	.032	.032±.010
.3125 SHOULDER .375 BALL LOCK	IAE 4	3/64 (.046)	9/64 (.140)	#8-32	.062	.062±.015
.3750 SHOULDER .4375 SHOULDER .5000 ALL .6250 BALL LOCK	IAE 6	1/16 (.062)	11/64 (.172)	#10-32	.062	.062±.015
.6250 SHOULDER .7500 ALL .8750 ALL 1.0000 ALL 1.2500 BALL LOCK 1.2500 SHOULDER	IAE 9	3/32 (.093)	#2 (.221)	#1/4-28	.062	.062±.015
CONSULT FACTORY	IAE 12	1/8 (.125)	9/32 (.281)	#5/16-24	—	.062±.015

PUNCH EJECTOR COMPONENTS

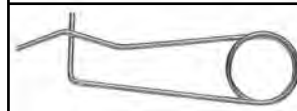
PART DESCRIPTION	SPEC. DESCRIPTION	IAE 2	IAE 3	IAE 4	IAE 6	IAE 9	IAE 12
SET SCREW 	THREAD SIZE "T"	3-48	5-40	8-32	10-32	1/4-28	5/16-24
	LENGTH "L"	.19	.19	.19	.19	.25	.25
SPRING 	DIAMETER "D" $+0.000$ -0.010	.078	.094	.130	.164	.216	.270
	FREE-LENGTH "F" $+0.060$ -0.010	2.38	2.38	3.19	3.19	3.19	3.19
	PRESSURE (1/8" PRE-LOAD) lbs.	.5	.75	1	1.5	2	2.5
PIN 	BODY DIAMETER "N" $+0.001$ -0.002	.019	.027	.041	.058	.089	.120
	LENGTH "L" $+0.062$ -0.000	1.38	1.38	1.94	1.94	2.50	3.00
	HEAD DIAMETER "H" $+0.001$ -0.002	.048	.078	.094	.125	.158	.188
	HEAD THICKNESS "T" $+0.005$ -0.005	.032	.046	.062	.062	.094	.094

CATALOG NUMBERS			
ASSEMBLY	PIN	SPRING	SCREW
IAE 2	IAE 2P	IAE 2S	IAE 2C
IAE 3	IAE 3P	IAE 3S	IAE 3C
IAE 4	IAE 4P	IAE 4S	IAE 4C
IAE 6	IAE 6P	IAE 6S	IAE 6C
IAE 9	IAE 9P	IAE 9S	IAE 9C
IAE 12	IAE 12P	IAE 12S	IAE 12C

LOCK OUT HOLE



EJECTOR PIN
LOCK OUT KIT
CAT. NO. IAL-01



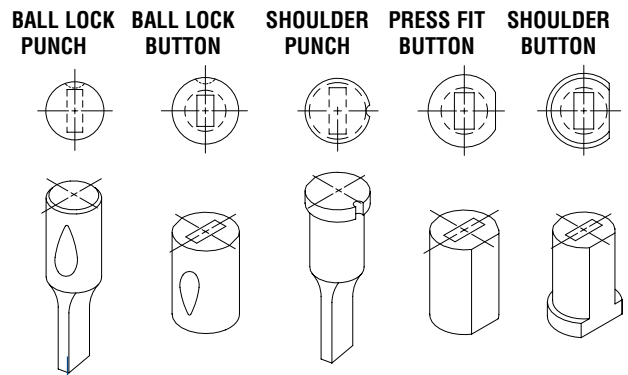
Set includes 12 pcs of each size.

LOCATING DEVICES

STANDARD LOCATION

Standard ballseat location for all ball lock products is 90°. Standard flat, dowel groove and Windsor Lock location is at 0°. Note: 0° is at 3:00. Alternate no charge locations are 0°, 90°, 180°, 270° (see drawing). To order alternate locations specify locating device type @ ____°.

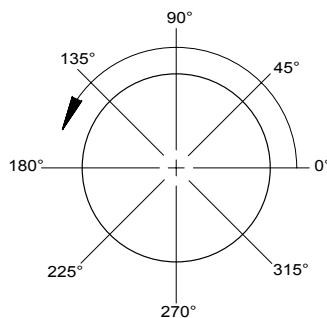
Ball lock punch example: IHR 50-300 P=.375 W=.250 B/S @ 0°
Button flat example: IDO100-125 P=.500 W=.375 F1@90°



CUSTOM LOCATIONS

Any locating device can be radially positioned by specifying the appropriate device and its desired angle. The appropriate angle is defined by a counter clockwise rotation from 0°.

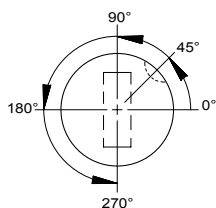
Note: Parts are viewed in die position looking from above the die. Punches are viewed looking through the shanks. Buttons are viewed through top face.



TYPICAL EXAMPLES:

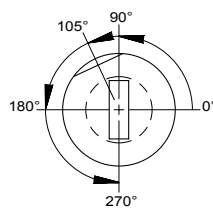
CUSTOM BALL SEAT
LOCATION PUNCH

BS@45°

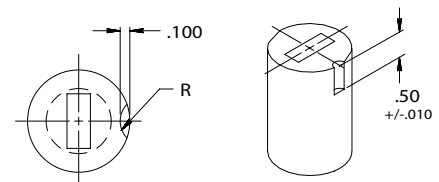


CUSTOM FLAT LOCATION
DIE BUTTON

F2@105°



WINDSOR LOCK



W2

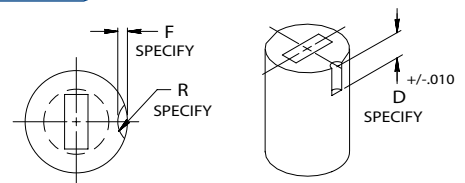
1/4 WINDSOR LOCK R = .125 RAD

W3

3/8 WINDSOR LOCK R = .188 RAD

W5

1/2 WINDSOR LOCK R = .250 RAD



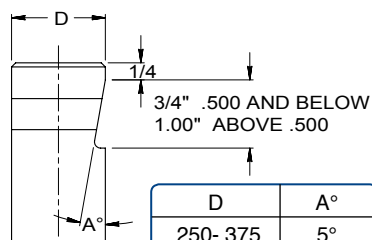
WX

USER DEFINED
must specify "F", "R" and "D"
Dimensions

WHISTLE NOTCH

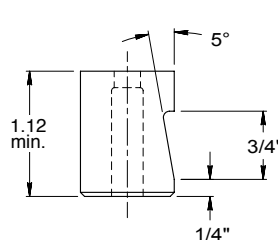
W1

PUNCHES



D	A°
.250-.375	5°
.500	7.50°
.625-1.25	10°

BUTTONS



NOTE: Must specify radial location on shaped products. For punches use light duty ball lock code Whistle notch will be ground over ball seat.

BALL SEAT

GB

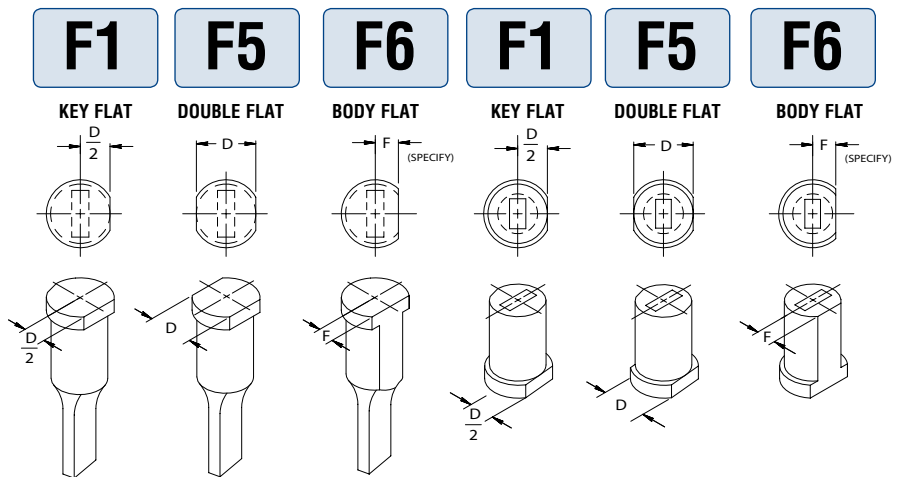
BALL SEAT
GRIND CHARGE

NOTE: Specify a radial location if a double ballseat is required.

LOCATING DEVICES

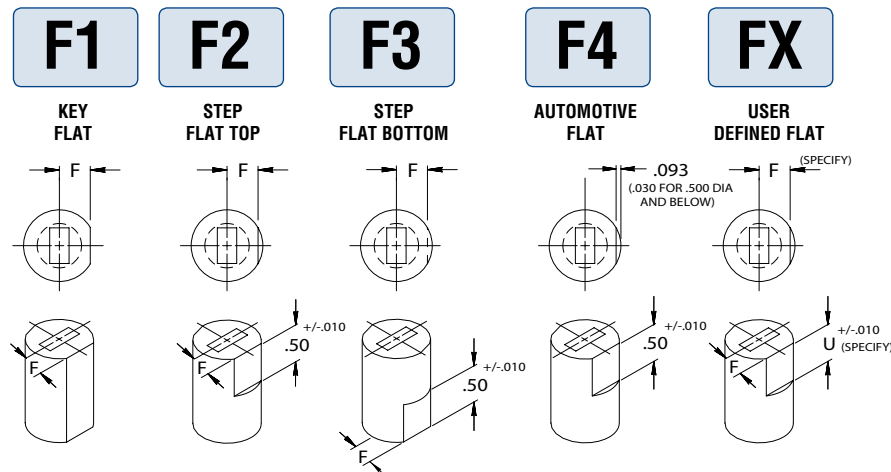
FLATS ON SHOULDER PRODUCTS

F1, F5 are ground flush to shank. F6 is a user defined flat and requires an "F" dimension specified with order. F5 flats are standard 180° apart.



FLATS ON PRESS FIT BUTTONS

F1 uses "F" dimension as defined in chart unless an alternate "F" dimension is specified with order. F2 and F3 use "F" dimension as defined in chart. FX is a user defined flat and requires an "F" and "U" dimension specified with order.

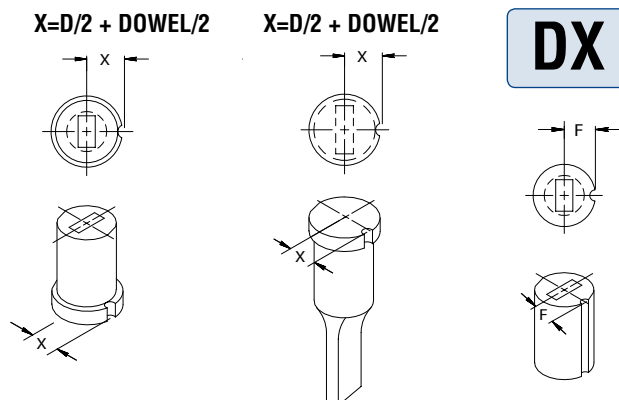


BODY DIAMETER	"F"
.2500	.110
.3125	.135
.3750	.165
.4375	.190
.5000	.220
.6250	.270
.7500	.325
.8750	.380
1.000	.435
1.250	.540
1.500	.650
1.750	.775
2.000	.900
2.250	1.025
2.500	1.150
2.750	1.275
3.000	1.400

D12, D18

DOWEL GROOVES

D12, D18 are standard 1/8, 3/16 dowel grooves. On shoulder products, the groove is positioned tangent to shank. On all other products the dowel is ground to an "F" dimension as shown on chart. DX is a user defined dowel groove and requires an "F" dimension and dowel size specified with the order.



BODY DIAMETER "D"	DX SPECIFY DOWEL	D12 .1250 DOWEL	D18 .1875 DOWEL
	"F" DIM	"F" DIM	"F" DIM
.2500	SPECIFY	.1625	.1938
.3125	SPECIFY	.1875	.2188
.3750	SPECIFY	.2125	.2438
.4375	SPECIFY	.2375	.2688
.5000	SPECIFY	.2625	.2938
.6250-3.0000	SPECIFY	D/2	D/2

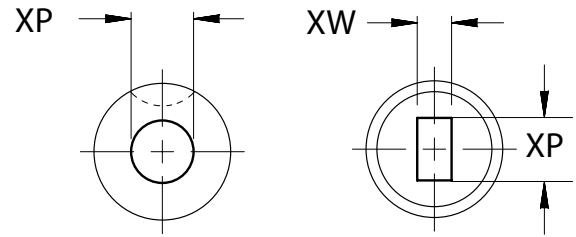
STANDARD ALTERATIONS

XP

OUT OF RANGE PUNCH POINT

XW

Point "P" or "W" dimensions below catalog standard.
The minimums (see charts) apply to standard catalog point lengths and overall lengths. Extended B lengths and reduced overall lengths do not apply.



BALL LOCK AND SHOULDER PUNCHES SOLID

MIN P ROUNDS

SHANK D	MAX B .625	MAX B .750	MAX B 1.000	MAX B 1.250	MAX B 1.500
18	.050	.060	.060	—	—
25	.050	.060	.060	—	—
31	.060	.060	.060	.090	.125
37	.060	.060	.090	.125	.125
43	—	.090	.090	.125	.125
50	—	.090	.090	.125	.125
62	—	.156	.156	.187	.187
75	—	.250	.250	.250	.250
87	—	.312	.312	.312	.312
100	—	.375	.375	.375	.375
125	—	.437	.437	.437	.437

MIN W SHAPES

SHANK D	MAX B .625	MAX B .750	MAX B 1.000	MAX B 1.250	MAX B 1.500
18	.050	.060	.060	—	—
25	.050	.060	.060	—	—
31	.060	.060	.060	.090	.125
37	.060	.060	.090	.125	.125
43	—	.090	.090	.125	.125
50	—	.090	.090	.125	.125
62	—	.156	.156	.156	.187
75	—	.250	.250	.250	.250
87	—	.250	.250	.250	.250
100	—	.250	.250	.250	.250
125	—	.250	.250	.250	.250

LIGHT DUTY EJECTOR PUNCHES

MIN P ROUND

SHANK D	MAX B .625	MAX B .750	MAX B 1.000	MAX B 1.250
25	.078	.078	—	—
37	.110	.110	.110	—
50	.156	.156	.156	.156
62	.187	.187	.187	.187
75	—	.250	.250	.250
87	—	.312	.312	.312
100	—	.375	.375	.375

MIN W SHAPES

SHANK D	MAX B .625	MAX B .750	MAX B 1.000	MAX B 1.250
25	.078	.078	—	—
37	.110	.110	.110	—
50	.156	.156	.156	.156
62	.156	.156	.156	.156
75	—	.187	.187	.187
87	—	.218	.218	.218
100	—	.250	.250	.250

HEAVY DUTY EJECTOR PUNCHES

MIN P ROUNDS

SHANK D	MAX B 1.000	MAX B 1.250	MAX B 1.500
37	.110	—	—
50	.156	.156	.156
62	.187	.187	.187
75	.250	.250	.250
87	—	.312	.312
100	—	.375	.375
125	—	.437	.437

MIN W SHAPES

SHANK D	MAX B 1.000	MAX B 1.250	MAX B 1.500
37	.110	—	—
50	.156	.156	.156
62	.156	.156	.156
75	.187	.187	.187
87	—	.218	.218
100	—	.250	.250
125	—	.281	.281

SHOULDER BASIC/SELECTIVE EJECTOR PUNCHES

MIN P ROUNDS

SHANK D	MAX B .625	MAX B .750	MAX B 1.000	MAX B 1.250	MAX B 1.500
18	.062	.062	.062	—	—
25	.078	.078	.078	—	—
31	.110	.110	.110	.125	.125
37	—	.156	.156	.156	.187
43	—	.156	.156	.156	.187
50	—	—	.156	.156	.187
62	—	—	.218	.218	.250
75	—	—	—	.312	.312
87	—	—	—	.312	.312
100	—	—	—	.312	.375
125	—	—	—	.437	.437

MIN W SHAPES

SHANK D	MAX B .625	MAX B .750	MAX B 1.000	MAX B 1.250	MAX B 1.500
18	.062	.062	.062	—	—
25	.078	.078	.078	—	—
31	.110	.110	.110	.125	.125
37	—	.156	.156	.156	.187
43	—	.156	.156	.156	.187
50	—	—	.156	.156	.187
62	—	—	.187	.187	.250
75	—	—	—	.218	.250
87	—	—	—	.218	.250
100	—	—	—	.218	.250
125	—	—	—	.250	.250

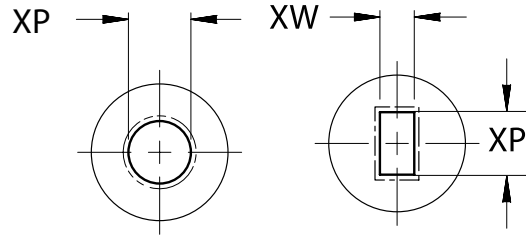
STANDARD ALTERATIONS

XP

OUT OF RANGE BUTTON DIMENSIONS

Hole "P" or "W" dimension above or below catalog standard range (see charts) available on Ultra Life style button only.

XW



PRESS FIT ULTRA LIFE TAPER RELIEF

BODY	MIN P DIA	MIN W DIM	MAX P/G
25	.062	.062	.140
31	.062	.062	.180
37	.062	.062	.220
43	.078	.078	.280
50	.078	.078	.320
62	.078	.078	.365
75	.125	.125	.490
87	.250	.125	.593
100	.312	.125	.688
125	.437	.156	.875
150	.500	.156	1.125
175	.625	.156	1.438
200	.750	.250	1.688
225	.875	.250	1.875
250	1.000	.250	2.125
275	1.125	.250	2.375
300	1.250	.250	2.625

SHOULDER ULTRA LIFE TAPER RELIEF

MIN P DIA	MIN W DIM	MAX P/G
.062	.062	.140
.062	.062	.180
.062	.062	.220
.078	.078	.280
.078	.078	.320
.078	.078	.365
.125	.125	.490
.250	.125	.593
.312	.125	.688
.437	.156	.875
.500	.156	1.125
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

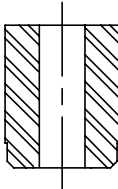
BALL LOCK ULTRA LIFE TAPER RELIEF

MIN P DIA	MIN W DIM	MAX P/G
—	—	—
—	—	—
—	—	—
—	—	—
.078	.078	.250
.078	.078	.375
.125	.125	.437
.250	.125	.562
.312	.125	.688
.437	.156	.875
.500	.156	1.125
.624	.156	1.250
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

XR

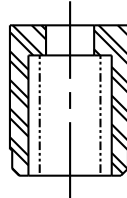
NO RELIEF

Button shape/
I.D. through
hole no relief



X0

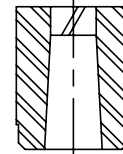
OPEN RELIEF



Specify required relief diameter

XS

SLUG CONTROL ALTERATION

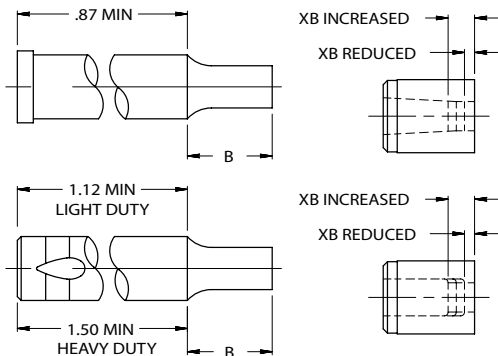


NOTE: Advise
material thickness
and die clearance,
per side at time of
order.

XB

ALTERED POINT LENGTH OR LAND DIMENSION

This is a customer specific alteration
and a dimension must be supplied.



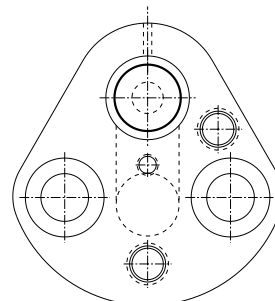
AE

AIR EJECTOR APPLICATION

Filled cross pin hole with no ejector components.

SR

OPEN IN-LINE DOWEL FOR SLUG RELIEF

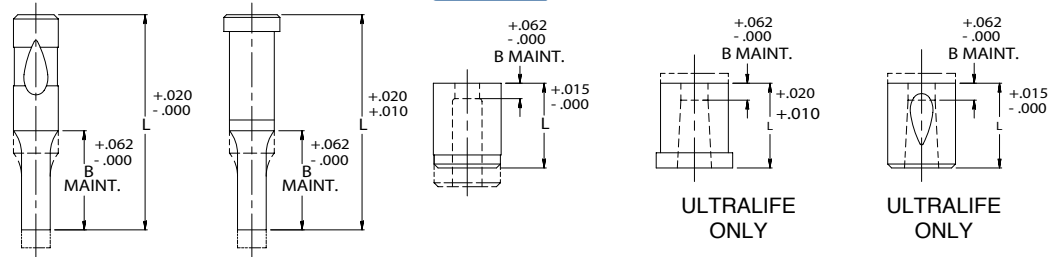


STANDARD ALTERATIONS

OVERALL LENGTH REDUCTIONS

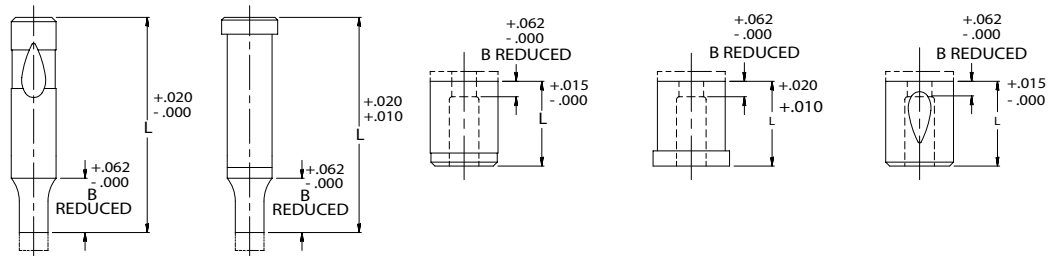
Reduces punch or button length maintaining "B" point or land length. Not available in counter bore style on shoulder or ball lock buttons.

X1



X2

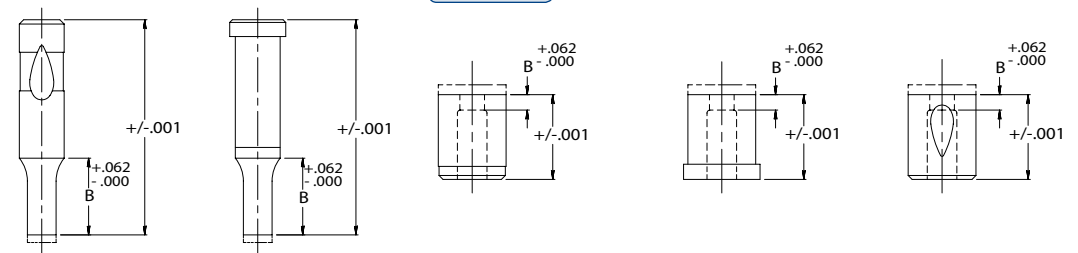
Reduces punch or button length but also reduces "B" dimension or land length.



X3

Provides a precision overall length of ± 0.001

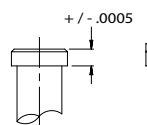
Note: $.020$ maximum stock removal



HEAD ALTERATIONS

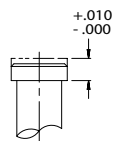
X4

Provides a precision head length but reduces overall length



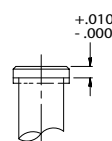
X5

Reduces head length but reduces overall length



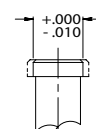
X6

Reduces head length while maintaining overall length



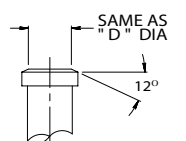
X7

Reduces head diameter



X8

Angle on head face to improve strength



SPECIAL ALTERATIONS

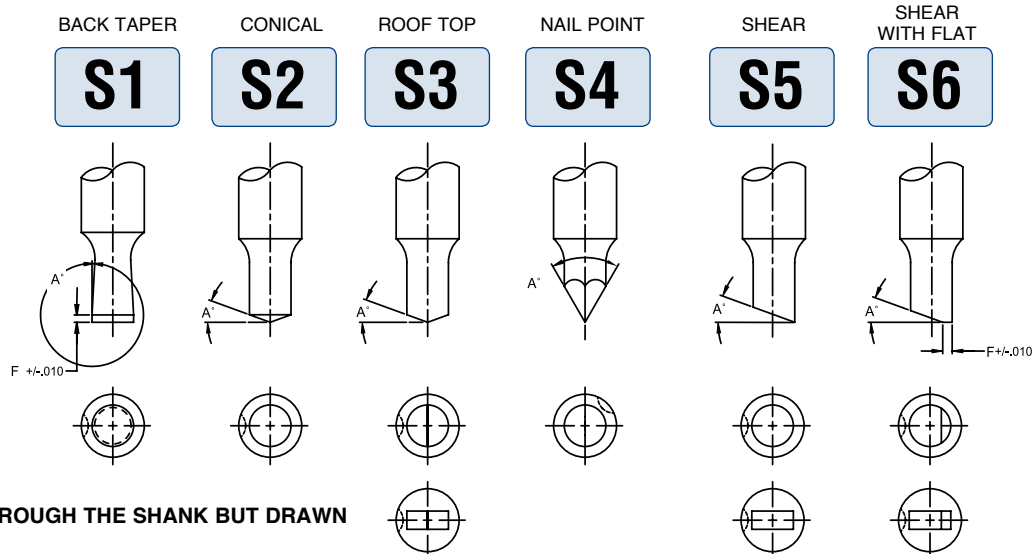
SHEAR ANGLES

Angle "A" and dimension "F" are user defined and must be specified with order.

STANDARD LOCATION DEVICES:

Standard Ball Seat location as shown.

Shoulder Flat location counter clockwise 90°.

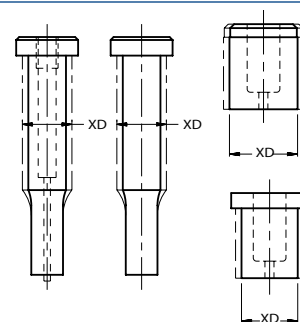


XD REDUCTION OF SHANK DIMENSION

Reduce shank to customer specific size. Does not alter head diameter.

Example: IDO 75-100
P=.400 W=.125, XD=.714

BODY	18	25	31	37	43	50	62	75	87	100	125	150
PUNCH SOLID MIN D	.126	.188	.251	.313	.376	.438	.501	.626	.751	.876	1.001	—
PUNCH EJECTOR MIN D	.172	.219	.282	.344	.376	.438	.563	.688	.751	.938	1.188	—
BUTTON MIN D		.230	.282	.344	.407	.470	.583	.688	.813	.938	1.125	1.375

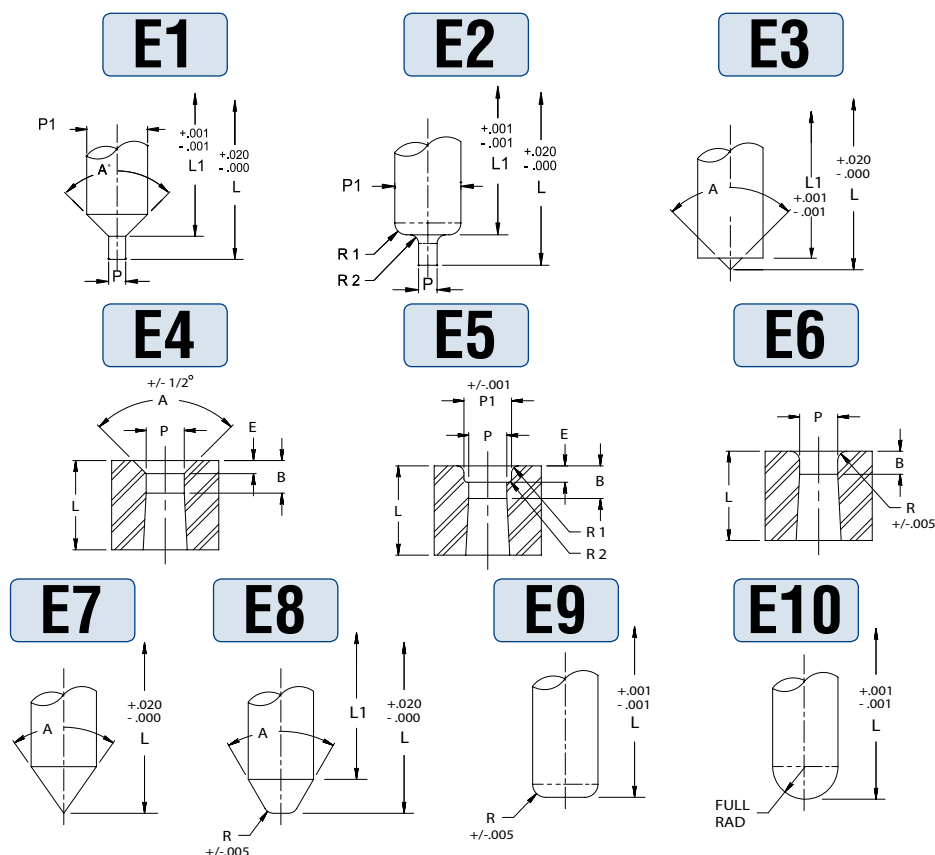


EXTRUSION TOOLS

How precise L1 and E dimensions need to be is application specific. Please specify tolerance with order.

For a precision "L" dimension add alteration code X3.

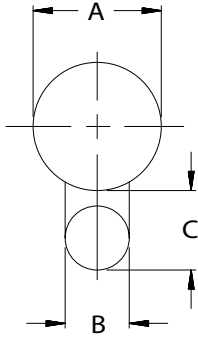
For strength, all extrusion buttons are produced in the "Ultralife" style.



BALL-LOCK SPACE REQUIREMENTS

Backing Plate Style Ball Lock Space Requirements

*Add .07 to 'C'
Dimension on True Set
Style Retainers



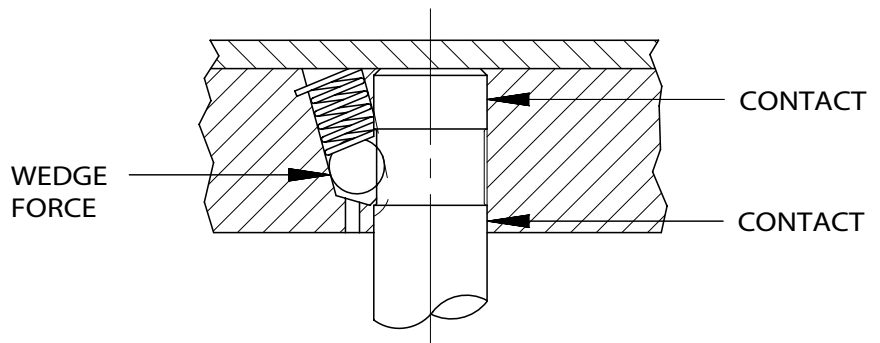
DIE BUTTON AND LIGHT-DUTY PUNCH FOR PIERCING STOCK UP TO 1/8"			HEAVY-DUTY PUNCH FOR PIERCING STOCK UP TO 3/8"			EXTRA-HEAVY DUTY PUNCH FOR PIERCING STOCK OVER 3/8"		
DIA. PUNCH SHANK OR DIE BUTTON O.D. A	BALL DIA. B	CLEARANCE C	DIA. PUNCH SHANK A	BALL DIA. B	CLEARANCE C	DIA. PUNCH SHANK A	BALL DIA. B	CLEARANCE C
.250	.250	.375	.375	.375	.500	1.000	.750	.968
.375	.250	.375	.500	.500	.625	1.250	.750	.968
.500	.312	.437	.625	.500	.625	1.500	.750	.968
.625	.312	.437	.750	.500	.625	1.750	.750	.968
.750	.375	.500	.875	.500	.625	2.000	.750	.968
.875	.375	.500	1.000	.500	.625	2.250	.750	.968
1.000	.375	.500	1.250	.500	.625	2.500	.750	.968
1.250	.375	.500						
1.500	.375	.500						
1.750	.375	.500						

True-Set Style Ball Lock Space Requirements

DIE BUTTON AND LIGHT-DUTY PUNCH FOR PIERCING STOCK UP TO 1/8"			HEAVY-DUTY PUNCH FOR PIERCING STOCK UP TO 3/8"		
DIA. PUNCH SHANK OR DIE BUTTON O.D. A	BALL DIA. B	CLEARANCE C	DIA. PUNCH SHANK A	BALL DIA. B	CLEARANCE C
.250	.250	.440	.375	.375	.625
.375	.250	.440	.500	.500	.750
.500	.312	.500	.625	.500	.750
.625	.312	.570	.750	.500	.750
.750	.375	.570	.875	.500	.750
.875	.375	.570	1.000	.500	.750
1.000	.375	.570	1.250	.500	.750
1.250	.375	.570			
1.500	.375	.570			
1.750	.375	.570			

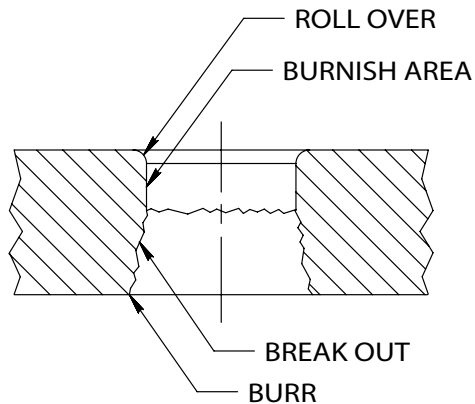
Body Band Ball Relief

Moeller incorporates a body band ball relief on all ball lock punches. This type of relief facilitates a rounder shank diameter, thusly improving the "fit" between the tool and its mating retainer. When centerless grinding, the interruption of contact caused by the ball-seat, generates a slight "hump" 180° opposite the ball-seat. Moeller's process includes grinding or precision turning the ball-relief area, thusly removing this out of round condition. This band relief also produces a balanced three point contact condition, improving the punches stability while in die position (see illustration).



Punch & Die Clearances

Clearance between punch and die is based upon type of material being stamped, material thickness, finish requirement of hole and anticipated tool life. It is expressed as a total percentage of material thickness being stamped. It is important to remember that the punch determines hole size and the die determines slug size. As a rule, optimal clearance provides flat, sharp and clean punching with minimum tool load. Insufficient clearance results in minimum burr and rollover, but tool life is shortened due to high tool loads. Excessive clearance results in deformation and larger rollover but increased tool life. Below are some general guidelines for different types of material being stamped. The values shown are recommended total die clearance for general purpose holes using non-ejector punches. By doubling the amount of clearance and using ejector punches, anticipated tool life will be greatly increased. Most of the punch wear is produced by stripping forces when the punch is being withdrawn. The increased clearance by using ejector punches helps keep tool wear to a minimum.



Suggested Clearance

Material	Soft	Hard
Aluminum	10%	12%
Brass/Copper	6%	8%
Steel (Low Carbon)	10%	12%
Steel (High Carbon)	18%	20%

Suggested Surface Treatment Applications

	PIERCE & TRIM	EXTRUDE & DRAW	FORM & EMBOSS	SHAVE & LANCE	COIN & HOB
M-Tride™	X	X	X	X	X
TiN	X	X		X	
TiCN	X	X	X	X	
MSP™	X	X	X	X	
M-Wear™	X	X	X	X	X
M-Wear Extreme™	X	X	X	X	X
Alcrona™	X	X	X	X	
TiAlN				X	
MoST™		X		X	
CDF	X	X	X	X	X

Note: Please reference the Moeller Performance Enhancement Coatings Brochure for additional surface treatments.

TiN – (Titanium Nitride) PVD Coating

Alteration Order Code: TIN • Add 3 days to Delivery

TiN is the least expensive and most commonly used PVD (physical vapor deposition) wear resistant coating offering:

- Excellent wear resistance on cutting edges and wear surfaces
- Excellent lubricity
- Suitable thermal stability for most cold work metalworking applications
- High micro hardness of 2300 Vickers*

Note: TiN works best when used with lubricants and is not recommended for uses in stainless steel, nickel, or copper applications

TiCN – (Titanium CarboNitride) PVD Coating

Alteration Order Code: TCN • Add 4 days to Delivery

TiCN has the broadest range of application use regarding PVD coatings including stainless steel, nickel, and copper metal working operations offering:

- Higher hardness and lower coefficient of friction than that of TiN coating, resulting in extremely high wear resistance on cutting edges and wear surfaces
- Improved lubricity
- Extremely high micro hardness of 3000 Vickers*

Note: Suitable for uses in stainless steel, nickel, or copper applications

TiAlN - (Titanium Aluminum Nitride) PVD Coating

Alteration Order Code: TAN • Add 3 days to Delivery

TiAlN is ideal for applications where surface heat is generated, which converts the aluminum constituent to aluminum oxide for added protection against shear stress and wear resistance on cutting edges.

- High thermal stability
- Extremely high micro hardness of 3400 Vickers*

MoST™ – (Titanium CarboNitride with Molybdenum Disulfide)

PVD w/Moly Top Coating

Alteration Order Code: MST • Add 7 days to Delivery

MoST coating reduces operating friction and galling through the use of a very lubricious top layer coat, which is ideal for pre-painted and plated material applications.

- Extremely high lubricity
- High micro hardness of 2000 Vickers*

In addition to surface treatments, a special heat treat enhancement process can be applied to optimize toughness.

MoST® is a trademark of IonBond® Inc.

MSP™ – (Moeller Special Process with TiCN)

PVD Top Coating

Alteration Order Code: MSP • Add 5 days to Delivery

MSP offers the ultimate in galling resistance while providing the wear resistance of TiCN coating.

- Superior surface finish
- Extremely high lubricity
- Extremely high micro hardness of 3000 Vickers*

Note: This process combines a high hardness coating with a superior surface finish to provide the ultimate in galling resistance.

Alcrona™ – (Aluminum Chromium Nitride) PVD Coating

Alteration Order Code: ACN • Add 3 days to Delivery

Performance is enhanced utilizing the thermal stability, low coefficient of friction and ductility advantages of the aluminum and chromium, making it ideal for high temperature and high strength steel applications.

- Exceptionally low coefficient of friction
- Extraordinary high thermal stability
- Extremely high micro hardness of 3400 Vickers*

Balanit® Alcrona is a trademark of Oerlikon Balzers.

PERFORMANCE ENHANCERS



M-Tride™ - (Nitride)

Alteration Order Code: MTN • Add 5 days to Delivery

MTN is a case hardening surface treatment, effecting all outer surfaces of the tool.

- Increases surface hardness by approximately 10 points HRC.

Note: It has the broadest range of use and is the least expensive of the surface treatments listed here. M-Tride case hardens all exposed surfaces and is ideal for die buttons and other tools with internal features which are difficult to coat using a PVD line of sight process.

M-Wear™

Alteration Order Code: MWN • Add 7 days to Delivery

A dual process surface treatment/coating process that provides a very hard coating on top of a less hard, but very tough surface treatment. This helps distribute load through the tool. Very beneficial for extruding or forming applications where isolated stress and load on small areas of the tool can cause premature failure.

- High micro hardness of 2300 Vickers*

Note: M-Wear works best when used with lubricants and is not recommended for use in stainless steel, nickel, or copper applications.

M-Wear Extreme™

Alteration Order Code: MWE • Add 7 days to Delivery

M-Wear Extreme is similar to M-Wear but with a lower coefficient of friction and higher wear resistance. Unlike M-Wear, it is suitable for stainless steel, nickel and copper applications.

- High micro hardness of 3000 Vickers*

CDF – (Cryogenic Deep Freeze)

Alteration Order Code: CDF • Add 2 days to Delivery

This process is an effective way to achieve optimum toughness and dimension stability even when exposed to temperatures up to fifty degrees Fahrenheit of the steel's original tempering temperature.

MOELLER
PRECISION TOOL

MPT CRIB.COM

INVENTORY MANAGEMENT SYSTEM



SYSTEM BENEFITS:

- INDUSTRY EXCLUSIVE SOFTWARE
- EASY AUDIT & ADAPTATION
- AUTOMATED MANAGEMENT
- REMOTE ACCESS & MORE!

ORGANIZED EFFICIENCIES

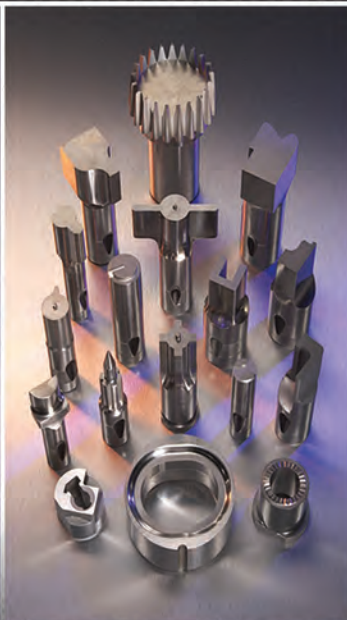
CERTIFIED
ISO
9001:2008

MOELLER

PRECISION TOOL



3D SURFACING



**KEY HOLE, SPLINE "TEE",
"L", "H", "U" OR OTHER
UNIVERSAL SHAPED TOOLS**



THREAD FORM TOOLS



**EXTRUSION, COUNTERSINK
COINING, COMPACTING AND
OTHER METAL FORMING
TOOLS**



MOELLER PRECISION TOOL - CORPORATE HEADQUARTERS

30893 CENTURY DRIVE • WIXOM, MICHIGAN 48393

PH: 248.668.1166 • FX: 248.668.1004 • TOLL FREE 800.521.7613



MOELLER PRECISION TOOL - SOUTH

3048 OWEN DRIVE • ANTIOCH, TENNESSEE 37013

PH: 615.371.0992 • FX: 615.371.9190 • TOLL FREE 800.227.7019



MOELLER PRECISION TOOL DE MEXICO

CIRCUITO EL MARQUES SUR# 43 • PARQUE INDUSTRIAL EL MARQUES

EL MARQUES, QUERETARO C.P. 76246

PH: 442.253.12.00 • FX: 442.253.12.01 • www.moellerdemexico.com.mx

E-Quote: quote@moellerpunch.com • www.moellerprecisiontool.com

REV. 1/2017
Catalog # 510
© Copyright 2017