

Standard Shapes		2		3		4		5		6		7	
L													
R			*BJ_	*BP_	BPT	*BPA	BJB & BPB	*BK_ & *BZ_					
K			Jektol® Punch	Regular Punch	Regular Pilot	Positive Pick-up Pilot	Punch Blanks						

CJ_	CP_	CPT	CPA	CJB & CPB	CK_ & CZ_
Jektol® Punch	Regular Punch	Regular Pilot	Positive Pick-up Pilot	Punch Blanks	Point Larger Than Shank
8	9	10	11	12	13

*BRA	*BRT & CRT	NRT & TRT	TRN	
Change Retainers	True Position*	Ultra-Compact Retainers	Light Duty Retainer	Multi Position Retainers
21	22	23	23	24, 25

*AD_ Counter- bored Relief	*AN_ Tapered Relief	CD_ CD	ADE/ADU EDM Matrix Blanks
14, 15	16	17	17

Jektole Data	Locking Devices	Classified Shapes	Retainer Accessories	Ball Release Tools	Punch Pullers	Ball Lock Punch Gage	Urethane Strippers & Stripping Units
26	20	18, 19	26	22	27	27	28, 29

The Catalog Designation completely defines the product, including shape, dimensions, tolerances and concentricity.

Example:
Line BPR
Product 13
Shape 13
B for Heavy Duty
P for Punch (Regular)
R for Rectangle

Shank Dia. D 13
 Point Length L₁ 13
 Overall Length L 80
 Point or Hole Size P8.9 W4.8

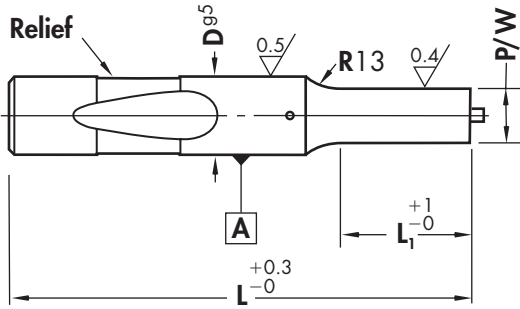
Catalog Number BPR™ 13 13 80
Dimensions as Specified P8.9 W4.8

*NAAMS™ Standard

Heavy Duty Jektol® Punches

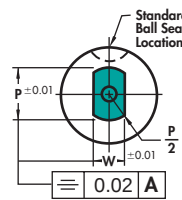
Steel:	HRC
M2, PS4	60-63

Type
BJ_

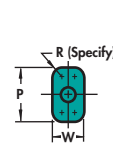


No side hole D32, 40

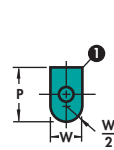
BJH



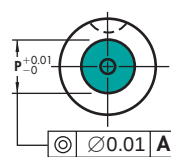
BJK



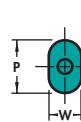
BJJ



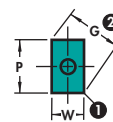
BJX



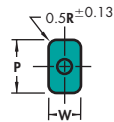
BJO



BJR



BJL



1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if matrix is ordered with punch to eliminate interference with matrix fillet when total clearance is 0.08 or less.

2 Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown. If G exceeds the max., see page 7.

$$G = \sqrt{P^2 + W^2}$$

D	Point Length L ₁			Type & D	Round Range P	Type & D	Shape		L							Jektole Pin
	Std.	Alt.	Alt.				Min. W	Max. P/G	63	71	80	90	100	110	125	
10	19	10*	—	BJX10	2.10- 9.97	BJ_10	2.10-	9.97	•	•	•	•	•			J4M†
13	19	13	25	BJX13	5.00-12.97	BJ_13	4.50-	12.97	•	•	•	•	•	•	•	J6M
16	19	13	25	BJX16	8.00-15.97	BJ_16	6.00-	15.97	•	•	•	•	•	•	•	J6M
20	19	13	25	BJX20	12.00-19.97	BJ_20	8.00-	19.97	•	•	•	•	•	•	•	J9M
25	19	13	25	BJX25	16.00-24.97	BJ_25	10.00-	24.97		•	•	•	•	•	•	J9M
32	19	13	25	BJX32	24.00-31.97	BJ_32	12.50-	31.97		•	•	•	•	•	•	J12M
40	25	19	30	BJX40	30.00-39.97	BJ_40	14.00-	39.97			•	•	•	•	•	J12M

*Min P or W = 1.60 when L₁ = 10

■ L₁ 25 not available.

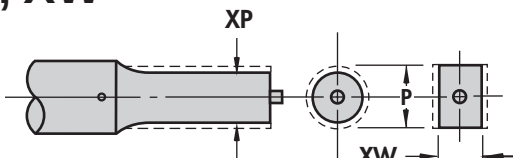
†J2 (P < 3.0)

Standard Alterations are beyond those sizes listed above and can be manufactured for a slight additional charge.

XBB adds 3 days to delivery

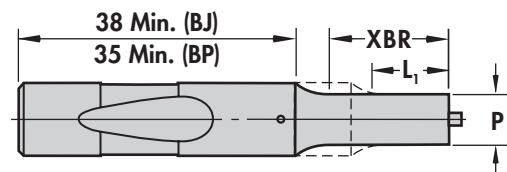
L ₁ Max	XBR						XBB					
	13	19	25	30	35	40	13	19	25	30	35	40
D	Minimum P Rounds						Minimum W Shapes					
10	1.4	1.5	2.4	3.2	4.0	5.0	1.4	1.5	2.4	4.0	4.0	5.0
13	4.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.5	5.0
16	4.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.5	6.0
20	6.0	6.0	6.0	7.6	7.6	7.6	6.0	6.0	6.0	6.0	6.0	6.0
25	8.0	8.0	8.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
32	10.0	10.0	10.0	10.0	10.0	10.0	7.2	7.2	7.2	7.2	7.2	7.2
40	12.0	12.0	12.0	12.0	12.0	12.0	7.2	7.2	7.2	7.2	7.2	7.2

XP, XW P or W Dimensions Smaller than Standard



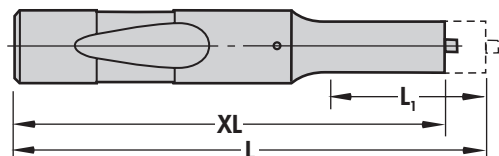
XBR Point Length Longer than Standard

Specify XBR or XBB and length (see chart at left)



XL Overall Length Shortened

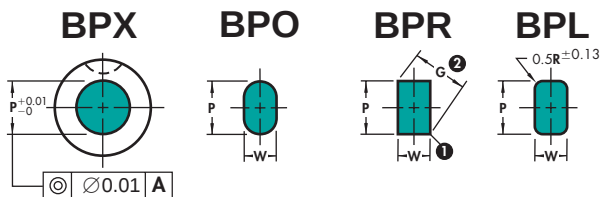
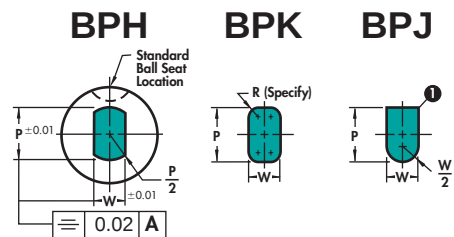
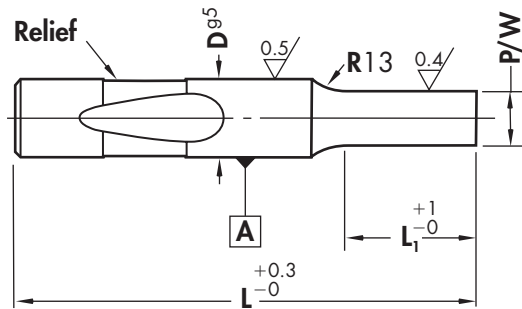
Stock removal from point end which shortens point length. To maintain point length specify XBR.



Steel:	HRC
M2, PS4	60-63

Heavy Duty Regular Punches

Type
BP_



① Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if matrix is ordered with punch to eliminate interference with matrix fillet when total clearance is 0.08 or less.

② Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown. If G exceeds the max., see page 7.

$$G = \sqrt{P^2 + W^2}$$

D	Point Length L ₁			Type & D	Round Range P	Type & D	Shape		L						
	Std.	Alt.	Alt.				Min. W	Max. P/G	63	71	80	90	100	110	125
10	19	10*	—	BPX10	2.10- 9.97	BP_10	2.10- 9.97		•	•	•	•	•	•	•
13	19	13	25	BPX13	5.00-12.97	BP_13	4.50-12.97		•	•	•	•	•	•	•
16	19	13	25	BPX16	8.00-15.97	BP_16	6.00-15.97		•	•	•	•	•	•	•
20	19	13	25	BPX20	12.00-19.97	BP_20	8.00-19.97		•	•	•	•	•	•	•
25	19	13	25	BPX25	16.00-24.97	BP_25	10.00-24.97		•	•	•	•	•	•	•
32	19	13	25	BPX32	24.00-31.97	BP_32	12.50-31.97		•	•	•	•	•	•	•
40	25	19	30	BPX40	30.00-39.97	BP_40	14.00-39.97		•	•	•	•	•	•	•

*Min P or W = 1.60 when L₁ = 10

■ L₁ 25 not available.

XN DayTride® A unique wear-resistant surface treatment.

XNT DAYTiN® Titanium Nitride coating for extra wear.

XK No Side Hole For air ejection. No cost. Components not supplied.

XJ Smaller Jektrole Components. See page 26.

Standard Ball Seat Locations

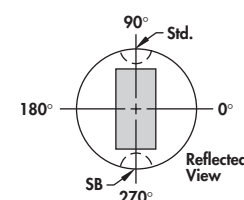
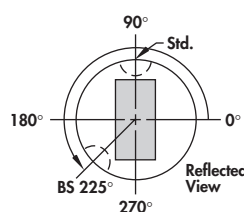
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180°, or 270° can be specified at *no additional cost*.

Custom Ball Seat Locations

Custom Ball Seat Locations can be specified as BS and degrees counter-clockwise from 0°.

Double Ball Seat Locations

A second ball seat can be specified. Normally located 180° from the primary ball seat these are used to minimize sharpening of notching punches by rotating the punch 180°. Specify SB and degree desired. Can also be located 90° from primary ball seat. *Not recommended for shank diameters under 20.*



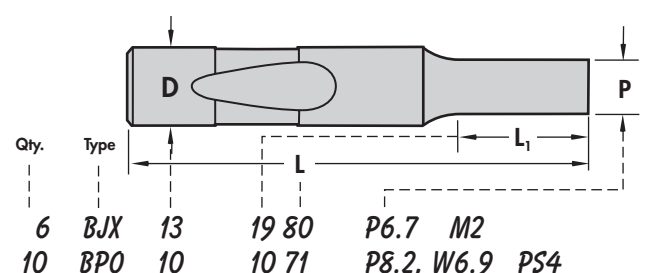
BJL & BPL Punches For Longer Life

Dayton's BJL & BPL punches with a constant corner radius of 0.5R puts the clearance where it's needed to prevent rapid wear and unacceptable burrs commonly generated with sharp corners. This reduces maintenance time and the risk of edge breaking during operation.

The "L" Long Life punch will reduce maintenance costs while increasing production runs by reducing corner wear.

How to Order:

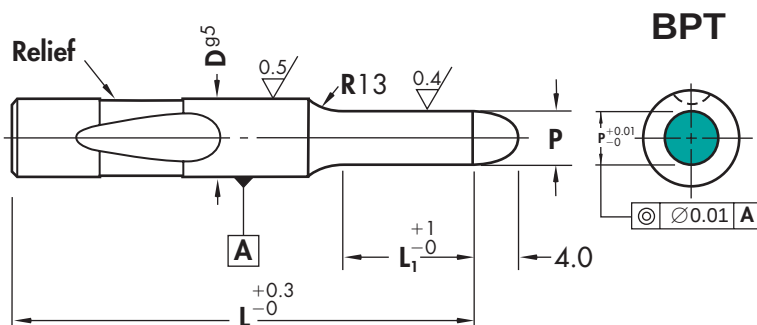
Specify: Quantity
Type
Shank & Length Codes
P or P&W Dimensions
Standard Alterations



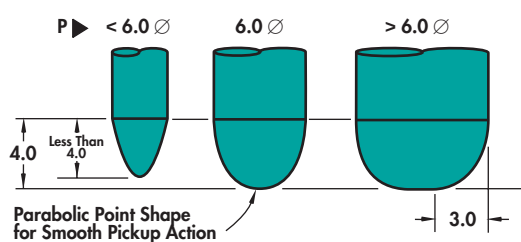
Heavy Duty Regular Pilots

Steel:	HRC
M2, PS4	60-63

Type BPT



BPT



When P = D Shank tolerance applies to full length

D	Point Length L ₁			Type & D	Round Range P	L						
	Std.	Alt.	Alt.			65	73	82	92	102	112	127
10	21	12*	—	BPT10	2.05-10.00	•	•	•	•	•	•	•
13	21	15	27	BPT13	4.95-13.00	•	•	•	•	•	•	•
16	21	15	27	BPT16	7.95-16.00	•	•	•	•	•	•	•
20	21	15	27	BPT20	11.95-20.00		•	•	•	•	•	•
25	21	15	27	BPT25	15.95-25.00		•	•	•	•	•	•
32	21	15	27	BPT32	23.95-32.00			•	•	•	•	•
40	27	21	32	BPT40	29.95-40.00				•	•	•	•

*Min P = 1.55 when L₁ = 12

■ L₁ 27 not available.

Standard Alterations for BPT and BPA Pilots

Standard Alterations are beyond those sizes listed above and can be manufactured for a slight additional charge.

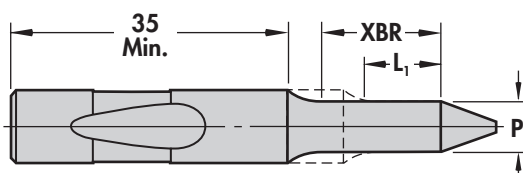
XBB and X3B adds 3 days to delivery

L ₁ Max	BPA BPT	XBB and X3B adds 3 days to delivery								
		XBR			XBB		X3B			
D		13	19	25	30	35	40	50	60	70
		15	21	27	32	37	42	—	—	—
		Minimum P								
10		1.40	1.45	2.35	3.15	3.95	4.95	5.95	5.95	7.95
13		2.05	2.35	3.15	3.15	3.95	4.95	5.95	5.95	7.95
16		3.95	3.95	3.95	3.95	3.95	5.95	5.95	5.95	7.95
20		5.95	5.95	5.95	7.55	7.55	7.55	7.55	7.55	7.95
25		7.95	7.95	7.95	9.95	9.95	9.95	9.95	9.95	9.95
32		9.95	9.95	9.95	9.95	9.95	9.95	9.95	9.95	9.95
40		11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95

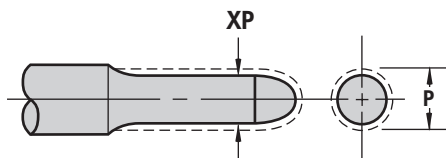
Shaded Area for BPA Only

Point Length Longer than Standard

Specify XBR, XBB, or X3B and length (see chart at left)



XP P Dimensions Smaller than Standard

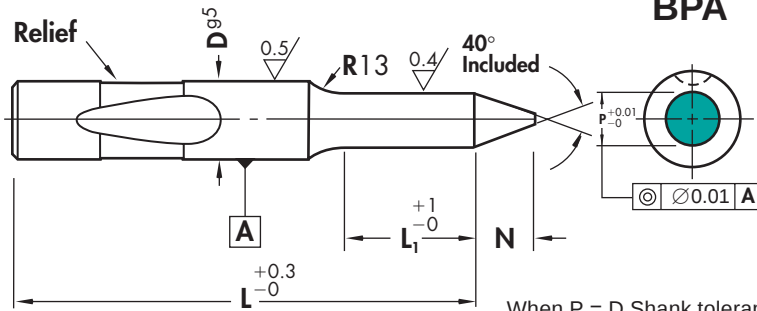


Steel:	HRC
M2, PS4	60-63

Heavy Duty Positive Pick-up Pilots

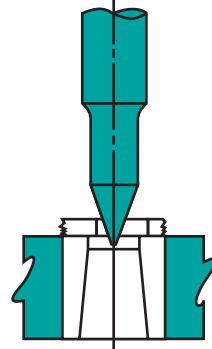
Order any length from 80 through 150mm

Type
BPA

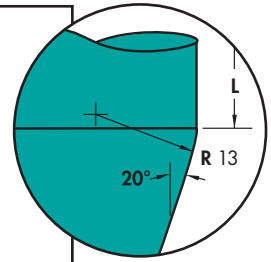


When P = D Shank tolerance applies to full length

Geometry provides smoother pick-up without the risk of distorting the hole.



Greater Positioning moves the stock further than conventional pilots.



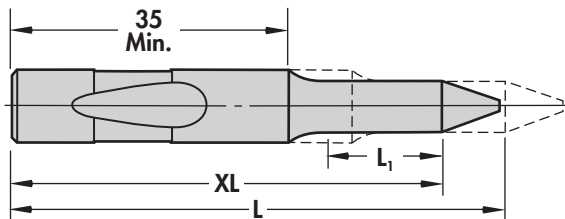
D	Point Length L ₁			Type & D	Round Range P	N	L						
	Std.	Alt.	Alt.				80	90	100	110	125	140	150
10	19	32		BPA10	5.00-10.00	8	•	•	•	•			
13	19	32		BPA13	9.00-13.00	10	•	•	•	•	•	•	
16	25	38	L	BPA16	12.00-16.00	15	•	•	•	•	•	•	•
20	25	38	Minus	BPA20	15.00-20.00	20	•	•	•	•	•	•	•
25	25	38	48	BPA25	19.00-25.00	25	•	•	•	•	•	•	•
32	25	38		BPA32	24.00-32.00	30	•	•	•	•	•	•	•
40	30	45		BPA40	30.00-40.00	40	•	•	•	•	•	•	•

Max L₁ 32 Max L₁ 42

BPA Pilots conform to NAAMS™ standard for Ball Lock Pilot Punches

XL Overall Length Shortened

Stock removal from point end. Standard or Alternate L₁ length is maintained on BPA only.

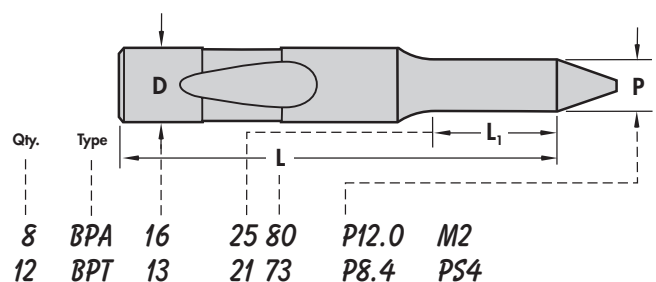


XN DayTride® A unique wear-resistant surface treatment.

XNT DAYTiN® Titanium Nitride coating for extra wear.

How to Order:

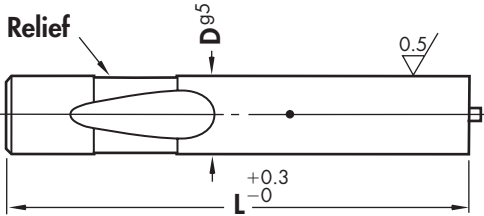
Specify: Quantity
Type
Shank & Length Codes
P Dimensions
Standard Alterations



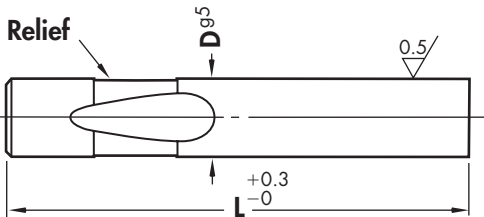
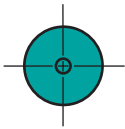
Heavy Duty Punch Blanks

Steel:	HRC
M2, PS4	60-63

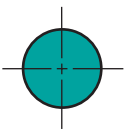
Type
BJB and BPB
Jektole® Regular



BJB



BPB



No side hole D32, 40

Jektole

D	Type & D	L							Jektole Pin
		63	71	80	90	100	110	125	
10	BJB10	•	•	•	•	•			J4M
13	BJB13	•	•	•	•	•	•		J6M
16	BJB16	•	•	•	•	•	•		J6M
20	BJB20	•	•	•	•	•	•		J9M
25	BJB25		•	•	•	•	•		J9M
32	BJB32		•	•	•	•	•		J12M
40	BJB40			•	•	•	•		J12M

Regular

D	Type & D	L						
		63	71	80	90	100	110	125
10	BPB10	•	•	•	•	•	•	•
13	BPB13	•	•	•	•	•	•	•
16	BPB16	•	•	•	•	•	•	•
20	BPB20	•	•	•	•	•	•	•
25	BPB25		•	•	•	•	•	•
32	BPB32		•	•	•	•	•	•
40	BPB40			•	•	•	•	•

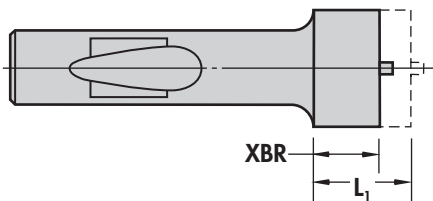
Standard Alterations for BZ and BK Punches

Standard Alterations are beyond those sizes listed above and can be manufactured for a slight additional charge.

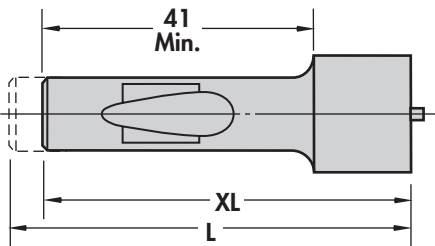
XN DayTride® A unique wear-resistant surface treatment.

XNT DAYTiN® Titanium Nitride coating for extra wear.

XBR Point Length Shorter Than Standard on Point Larger than Shank Punches.
(Shortens punch from the point end.)



XL Overall Length Shortened
Stock removal from shank end on Point Larger than Shank Punches. *Does not alter ball seat location.*
Stock removal from point end on BJB and BPB blanks.



Steel:	HRC
M2	60-63

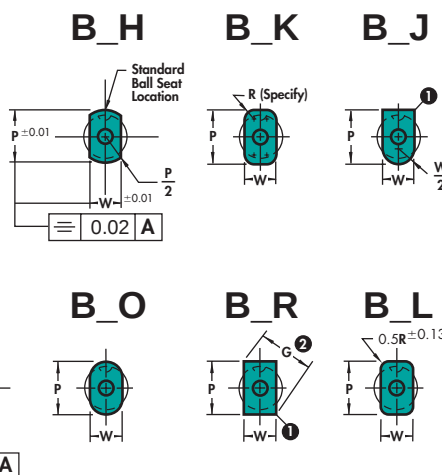
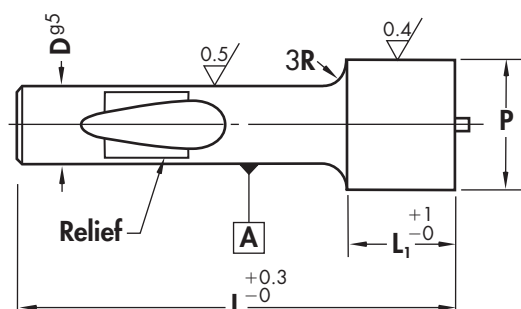
Heavy Duty

Point Larger than Shank Punches

Type

Jektol® BZ_

Regular BK_



① Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if matrix is ordered with punch to eliminate interference with matrix fillet when total clearance is 0.08 or less.

② Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown.
 $G = \sqrt{P^2 + W^2}$

Jektol

Point Length L, Std. Alt.	Type & D	Round Range P	Type & D	Shape Min. Max. W P/G	L 80 90 100	Jektol Pin
19 30	BZX13	13.10-32.00	BZ_13	5.00-32.00	• • •	J6
19 30	BZX16	16.10-38.00	BZ_16	6.00-38.00	• • •	J6
19 30	BZX20	20.10-40.00	BZ_20	8.00-40.00	• • •	J9
19 30	BZX25	25.10-44.00	BZ_25	10.00-44.00	• • •	J9
19 30	BZX32	32.10-50.00	BZ_32	11.50-50.00	• • •	J12
19 30	BZX40	40.10-56.00	BZ_40	14.00-56.00	• • •	J12

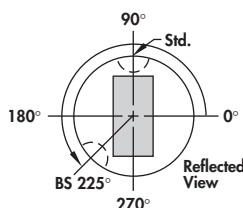
Regular

Point Length L, Std. Alt.	Type & D	Round Range P	Type & D	Shape Min. Max. W P/G	L 80 90 100
19 30	BKX13	13.10-32.00	BK_13	5.00-32.00	• • •
19 30	BKX16	16.10-38.00	BK_16	6.00-38.00	• • •
19 30	BKX20	20.10-40.00	BK_20	8.00-40.00	• • •
19 30	BKX25	25.10-44.00	BK_25	10.00-44.00	• • •
19 30	BKX32	32.10-50.00	BK_32	11.50-50.00	• • •
19 30	BKX40	40.10-56.00	BK_40	14.00-56.00	• • •

BZ & BK Punches conform to NAAMS™ standard for Ball Lock Punches

Standard Ball Seat Locations

Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180°, or 270° can be specified at no additional cost.

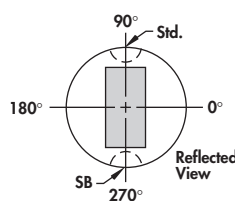


Custom Ball Seat Locations

Custom Ball Seat Locations can be specified as BS and degrees counter-clockwise from 0°.

Double Ball Seat Locations

A second ball seat can be specified. Normally located 180° from the primary ball seat these are used to minimize sharpening of notching punches by rotating the punch 180°. Specify SB and degree desired. Can also be located 90° from primary ball seat. *Not recommended for shank diameters under 20.*



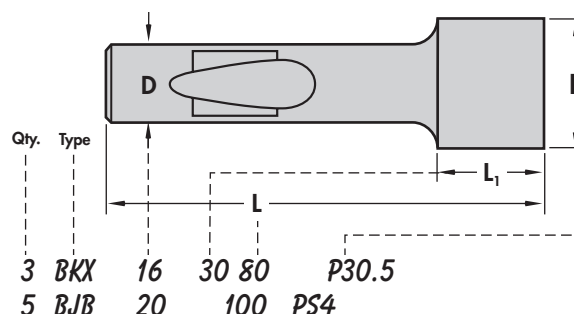
BZL & BKL Punches For Longer Life

Dayton's BZL & BKL punches with a constant corner radius of 0.5R puts the clearance where it's needed to prevent rapid wear and unacceptable burrs commonly generated with sharp corners. This reduces maintenance time and the risk of edge breaking during operation.

The "L" Long Life punch will reduce maintenance costs while increasing production runs by reducing corner wear.

How to Order:

Specify: Quantity
 Type
 Shank & Length Codes
 P or P&W Dimensions
 Standard Alterations

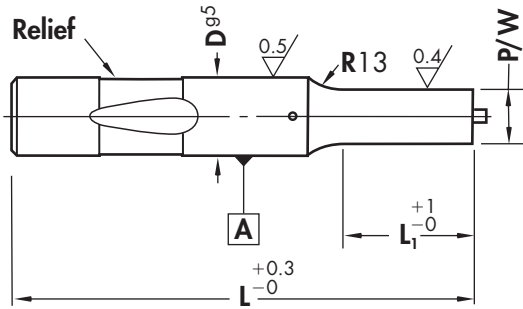


Light Duty Jektole® Punches

Steel:	HRC
A2, M2, PS4	60-63

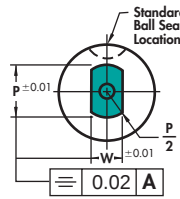
ISO 10071 — Ejector Punches

Type
CJ

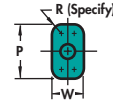


No side hole D32, 38

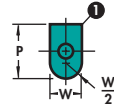
CJH



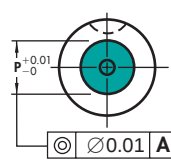
CJK



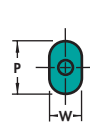
CJJ



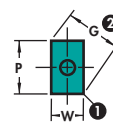
CJX



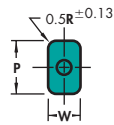
CJO



CJR



CJL



① Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if matrix is ordered with punch to eliminate interference with matrix fillet when total clearance is 0.08 or less.

② Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown. If G exceeds the max., see page 13.

$$G = \sqrt{P^2 + W^2}$$

D	Point Length L ₁			Type & D	Round Range P	Type & D	Shape		L					Jektole Pin
	Std.	Alt.	Alt.				Min. W	Max. P/G	63	71	80	90	100	
06	13	10*	—	CJX06	2.10- 5.97	CJ_06	2.10- 5.97		•	•	•	•	•	J3M**
10	19	10*	—	CJX10	2.10- 9.97	CJ_10	2.10- 9.97		•	•	•	•	•	J4M†
13	19	13	25	CJX13	5.00-12.97	CJ_13	4.50-12.97		•	•	•	•	•	J6M
16	19	13	25	CJX16	8.00-15.97	CJ_16	6.00-15.97		•	•	•	•	•	J6M
20	19	13	25	CJX20	12.00-19.97	CJ_20	8.00-19.97		•	•	•	•	•	J9M
25	19	13	25	CJX25	16.00-24.97	CJ_25	10.00-24.97		•	•	•	•	•	J9M
32	19	13	25	CJX32	24.00-31.97	CJ_32	12.50-31.97			•	•	•	•	J12M
38	25	19	30	CJX38	30.00-37.97	CJ_38	14.00-37.97				•	•	•	J12M

*Min P or W = 1.60 when L₁ = 10

** J2 (P < 2.0) †J2 (P < 3.0)

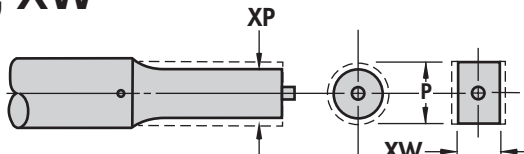
Standard Alterations for CJ and CP Punches

Standard Alterations are beyond those sizes listed above and can be manufactured for a slight additional charge.

XBB adds 3 days to delivery

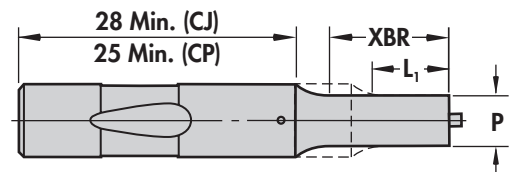
L ₁ Max	XBR						XBB					
	13	19	25	30	35	40	13	19	25	30	35	40
D	Minimum P Rounds						Minimum W Shapes					
06	1.4	1.4	2.0	2.5	—	—	1.4	1.4	2.0	3.0	—	—
10	1.4	1.5	2.4	3.2	4.0	5.0	1.4	1.5	2.4	4.0	4.0	5.0
13	4.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.5	5.0
16	4.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.5	6.0
20	6.0	6.0	6.0	7.6	7.6	7.6	6.0	6.0	6.0	6.0	6.0	6.0
25	8.0	8.0	8.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
32	10.0	10.0	10.0	10.0	10.0	10.0	7.2	7.2	7.2	7.2	7.2	7.2
38	12.0	12.0	12.0	12.0	12.0	12.0	7.2	7.2	7.2	7.2	7.2	7.2

XP, XW P or W Dimensions Smaller than Standard



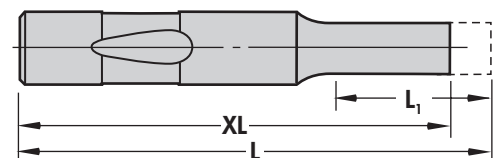
XBR Point Length Longer than Standard

Specify XBR or XBB and length (see chart at left)



XL Overall Length Shortened

Stock removal from point end which shortens point length. To maintain point length specify XBR.

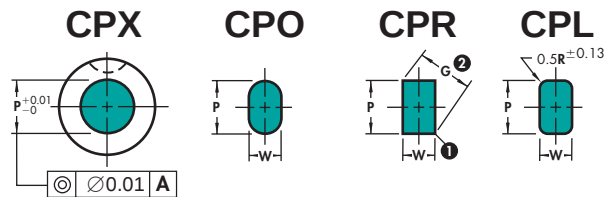
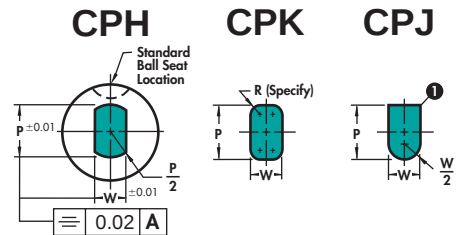
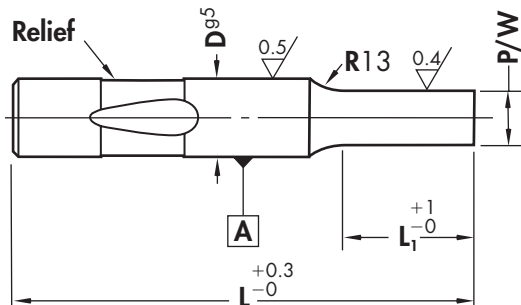


Steel:	HRC
A2, M2, PS4	60-63

Light Duty Regular Punches

ISO 10071 — Non-ejector Punches

Type
CP_



① Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if matrix is ordered with punch to eliminate interference with matrix fillet when total clearance is 0.08 or less.

② Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown. If G exceeds the max., see page 13.

$$G = \sqrt{P^2 + W^2}$$

D	Point Length L ₁			Type & D	Round Range P	Type & D	Shape Min. W Max. P/G		L				
	Std.	Alt.	Alt.						63	71	80	90	100
06	13	10*	—	CPX06	2.10- 5.97	CP_06	2.10- 5.97		•	•	•	•	•
10	19	10*	—	CPX10	2.10- 9.97	CP_10	2.10- 9.97		•	•	•	•	•
13	19	13	25	CPX13	5.00-12.97	CP_13	4.50-12.97		•	•	•	•	•
16	19	13	25	CPX16	8.00-15.97	CP_16	6.00-15.97		•	•	•	•	•
20	19	13	25	CPX20	12.00-19.97	CP_20	8.00-19.97		•	•	•	•	•
25	19	13	25	CPX25	16.00-24.97	CP_25	10.00-24.97		•	•	•	•	•
32	19	13	25	CPX32	24.00-31.97	CP_32	12.50-31.97			•	•	•	•
38	25	19	30	CPX38	30.00-37.97	CP_38	14.00-37.97				•	•	•

*Min P or W = 1.60 when L₁ = 10

XN DayTride® A unique wear-resistant surface treatment for M2 only.

XNT DAYTiN® Titanium Nitride coating for extra wear. Available for M2 only.

XK No Side Hole For air ejection. No cost. Components not supplied.

XJ Smaller Jektolo Components. See page 26.

Standard Ball Seat Locations

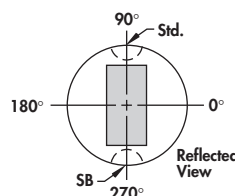
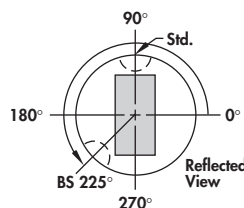
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180°, or 270° can be specified at *no additional cost*.

Custom Ball Seat Locations

Custom Ball Seat Locations can be specified as BS and degrees counter-clockwise from 0°.

Double Ball Seat Locations

A second ball seat can be specified. Normally located 180° from the primary ball seat these are used to minimize sharpening of notching punches by rotating the punch 180°. Specify SB and degree desired. Can also be located 90° from primary ball seat. *Not recommended for shank diameters under 20.*



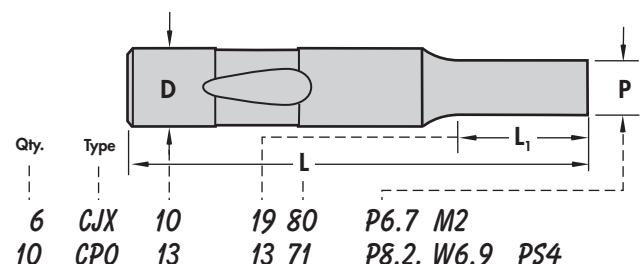
CJL & CPL Punches For Longer Life

Dayton's CJL & CPL punches with a constant corner radius of 0.5R puts the clearance where it's needed to prevent rapid wear and unacceptable burrs commonly generated with sharp corners. This reduces maintenance time and the risk of edge breaking during operation.

The "L" Long Life punch will reduce maintenance costs while increasing production runs by reducing corner wear.

How to Order:

Specify: Quantity
Type
Shank & Length Codes
P or P&W Dimensions
Steel
Standard Alterations

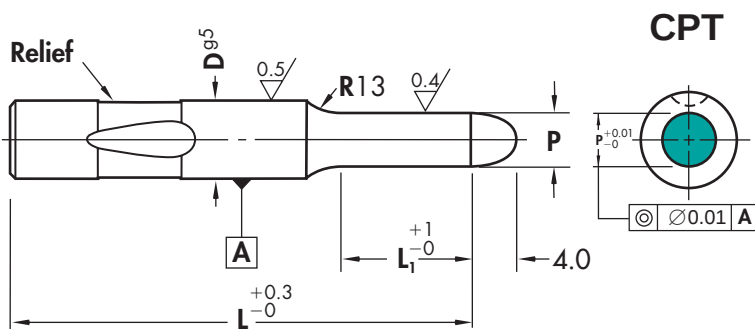


Light Duty Regular Pilots

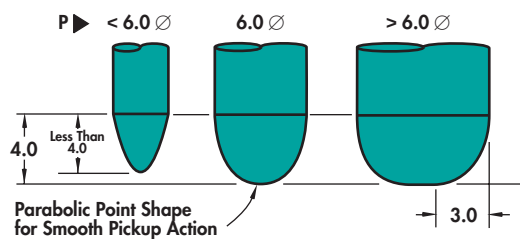
Steel:	HRC
A2, M2, PS4	60-63

ISO 10071

Type
CPT



CPT



When P = D Shank tolerance applies to full length

D	Point Length L ₁			Type & D	Round Range P	L						
	Std.	Alt.	Alt.			65	73	82	92	102	112	127
06	15	12*	—	CPT06	2.05- 6.00	•	•	•	•	•		
10	21	12*	—	CPT10	2.05-10.00	•	•	•	•	•	•	
13	21	15	27	CPT13	4.95-13.00	•	•	•	•	•	•	•
16	21	15	27	CPT16	7.95-16.00		•	•	•	•	•	•
20	21	15	27	CPT20	11.95-20.00		•	•	•	•	•	•
25	21	15	27	CPT25	15.95-25.00		•	•	•	•	•	•
32	21	15	27	CPT32	23.95-32.00			•	•	•	•	•
38	27	21	32	CPT38	29.95-38.00				•	•	•	•

*Min. P = 1.55 when L₁ = 12

Standard Alterations for CPT and CPA Pilots

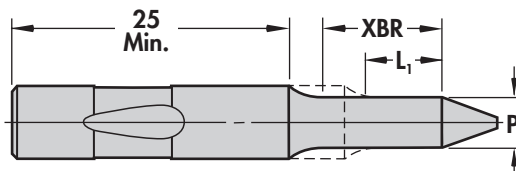
Standard Alterations are beyond those sizes listed above and can be manufactured for a slight additional charge.

		XBB and X3B adds 3 days to delivery								
L ₁ Max	CPA CPT	XBR			XBB		X3B			
		13 15	19 21	25 27	30 32	35 37	40 42	50 —	60 —	70 —
D		Minimum P								
06		1.40	1.40	1.95	2.45	—	—	—	—	—
10		1.40	1.45	2.35	3.15	3.95	4.95	5.95	5.95	7.95
13		2.05	2.35	3.15	3.15	3.95	4.95	5.95	5.95	7.95
16		3.95	3.95	3.95	3.95	3.95	5.95	5.95	5.95	7.95
20		5.95	5.95	5.95	7.55	7.55	7.55	7.55	7.55	7.95
25		7.95	7.95	7.95	9.95	9.95	9.95	9.95	9.95	9.95
32		9.95	9.95	9.95	9.95	9.95	9.95	9.95	9.95	9.95
38		11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95

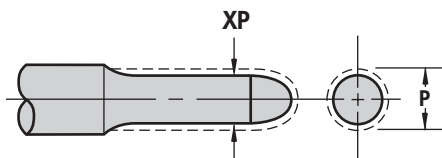
Shaded Area for CPA Only

Point Length Longer than Standard

Specify XBR, XBB, or X3B and length (see chart at left)



XP P Dimensions Smaller than Standard

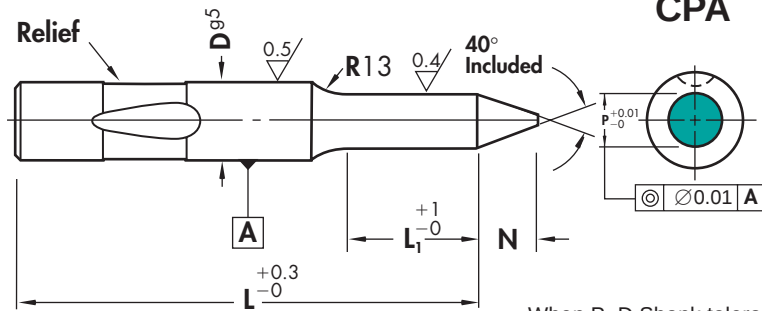


Steel:	HRC
M2	60-63

Light Duty Positive Pick-up Pilots

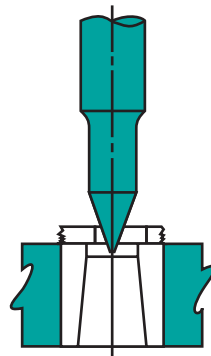
Order any length from 71 through 150mm

Type CPA

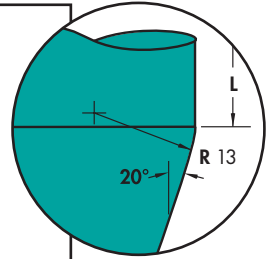


When P=D Shank tolerance applies to full length

Geometry provides smoother pick-up without the risk of distorting the hole.



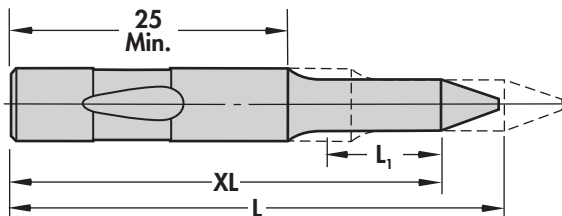
Greater Positioning moves the stock further than conventional pilots.



D	Point Length L ₁			Type & D	Round Range P	N	L							
	Std.	Alt.	Alt.				71	80	90	100	110	125	140	150
10	19	32		CPA10	5.00-10.00	8	•	•	•	•	•			
13	19	32		CPA13	9.00-13.00	10	•	•	•	•	•	•	•	
16	25	38	L	CPA16	12.00-16.00	15	•	•	•	•	•	•	•	•
20	25	38	Minus	CPA20	15.00-20.00	20	•	•	•	•	•	•	•	•
25	25	38	38	CPA25	19.00-25.00	25	•	•	•	•	•	•	•	•
32	25	38		CPA32	24.00-32.00	30		•	•	•	•	•	•	•
38	30	45		CPA38	30.00-38.00	35		•	•	•	•	•	•	•

Max. L₁ 33
Max. L₁ 42

XL Overall Length Shortened
Stock removal from point end. Standard or Alternate L₁ length is maintained on CPA only.

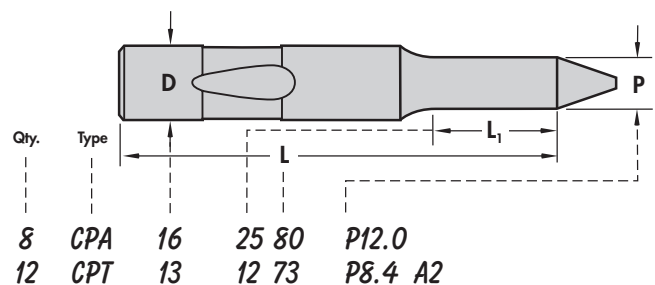


XN DayTride® A unique wear-resistant surface treatment for M2 only.

XNT DAYTiN® Titanium Nitride coating for extra wear. Available for M2 only.

How to Order:

Specify: Quantity
Type
Shank & Length Codes
P Dimensions
Steel
Standard Alterations

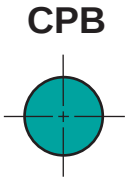
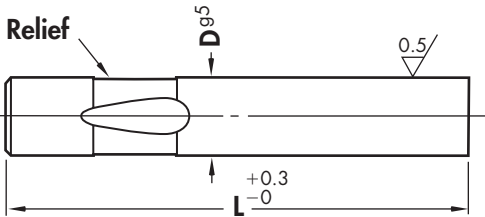
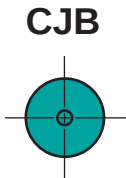
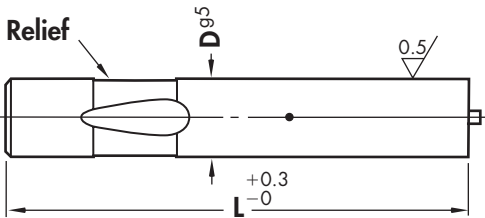


Light Duty
Punch Blanks

Steel:	HRC
A2, M2, PS4	60-63

ISO 10071

Type
CJB and CPB
Jektol® Regular



No side hole D32, 38

Jektol

D	Type & D	L					Jektol Pin
		63	71	80	90	100	
06	CJB06	•	•	•	•	•	J3M
10	CJB10	•	•	•	•	•	J4M
13	CJB13	•	•	•	•	•	J6M
16	CJB16	•	•	•	•	•	J6M
20	CJB20	•	•	•	•	•	J9M
25	CJB25	•	•	•	•	•	J9M
32	CJB32		•	•	•	•	J12M
38	CJB38			•	•	•	J12M

Regular

D	Type & D	L				
		63	71	80	90	100
06	CPB06	•	•	•	•	•
10	CPB10	•	•	•	•	•
13	CPB13	•	•	•	•	•
16	CPB16	•	•	•	•	•
20	CPB20	•	•	•	•	•
25	CPB25	•	•	•	•	•
32	CPB32		•	•	•	•
38	CPB38			•	•	•

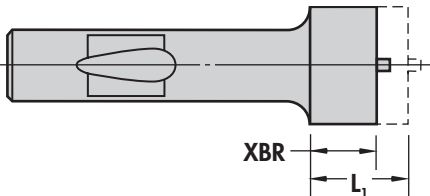
Standard Alterations for CZ and CK Punches

Standard Alterations are beyond those sizes listed above and can be manufactured for a slight additional charge.

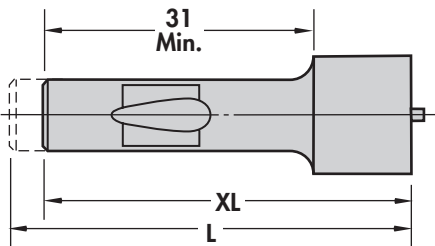
XN DayTride® A unique wear-resistant surface treatment for M2 only.

XNT DAYTiN® Titanium Nitride coating for extra wear. Available for M2 only.

XBR Point Length Shorter Than Standard on Point Larger than Shank Punches. (Shortens punch from the point end.)



XL Overall Length Shortened Stock removal from shank end on Point Larger than Shank Punches. Does not alter ball seat location. Stock removal from point end on CJB and CPB Blanks.



Steel:	HRC
A2, M2	60-63

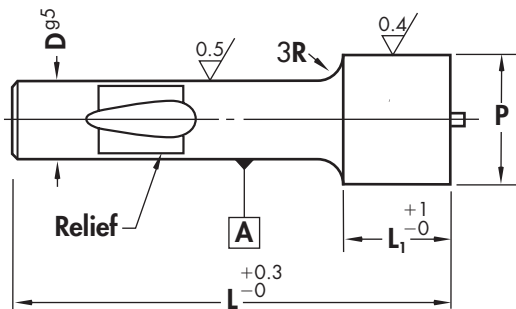
Light Duty

Point Larger than Shank Punches

Type

Jektol® CZ_

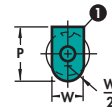
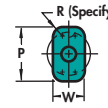
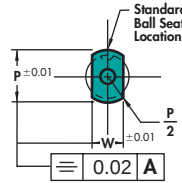
Regular CK_



C_H

C_K

C_J

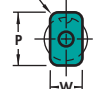
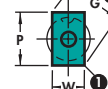
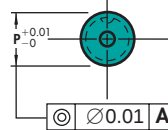


C_X

C_O

C_R

C_L



① Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if matrix is ordered with punch to eliminate interference with matrix fillet when total clearance is 0.08 or less.

② Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown.
 $G = \sqrt{P^2 + W^2}$

Jektol

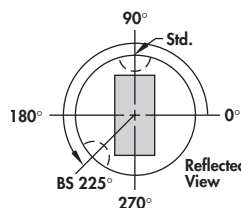
Point Length L, Std. Alt.	Type & D	Round Range P	Type & D	Shape Min. Max. W P/G	L 80 90 100	Jektol Pin
19 30	CZX13	13.10-32.00	CZ_13	5.00-32.00	• • •	J6
19 30	CZX16	16.10-38.00	CZ_16	6.00-38.00	• • •	J6
19 30	CZX20	20.10-40.00	CZ_20	8.00-40.00	• • •	J9
19 30	CZX25	25.10-44.00	CZ_25	10.00-44.00	• • •	J9
19 30	CZX32	32.10-50.00	CZ_32	11.50-50.00	• • •	J12

Regular

Point Length L, Std. Alt.	Round Type & D	Range P	Shape Type & D	Min. Max. W P/G	L 80 90 100
19 30	CKX13	13.10-32.00	CK_13	5.00-32.00	• • •
19 30	CKX16	16.10-38.00	CK_16	6.00-38.00	• • •
19 30	CKX20	20.10-40.00	CK_20	8.00-40.00	• • •
19 30	CKX25	25.10-44.00	CK_25	10.00-44.00	• • •
19 30	CKX32	32.10-50.00	CK_32	11.50-50.00	• • •

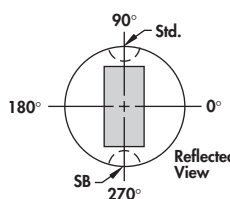
Standard Ball Seat Locations

Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180°, or 270° can be specified at *no additional cost*.



Custom Ball Seat Locations

Custom Ball Seat Locations can be specified as BS and degrees counter-clockwise from 0°.



Double Ball Seat Locations

A second ball seat can be specified. Normally located 180° from the primary ball seat these are used to minimize sharpening of notching punches by rotating the punch 180°. Specify SB and degree desired. Can also be located 90° from primary ball seat. *Not recommended for shank diameters under 20.*

CZL & CKL Punches For Longer Life

Dayton's CZL & CKL punches with a constant corner radius of 0.5R puts the clearance where it's needed to prevent rapid wear and unacceptable burrs commonly generated with sharp corners. This reduces maintenance time and the risk of edge breaking during operation.

The "L" Long Life punch will reduce maintenance costs while increasing production runs by reducing corner wear.

How to Order:

Specify: Quantity

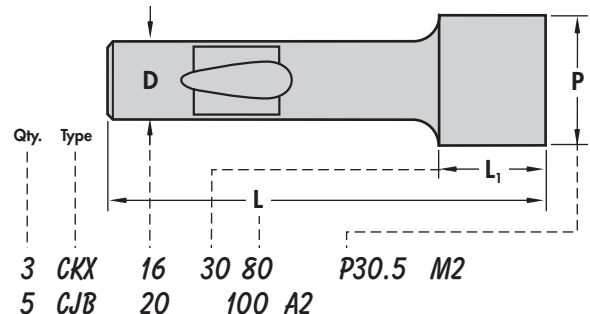
Type

Shank & Length Codes

P or P&W Dimensions

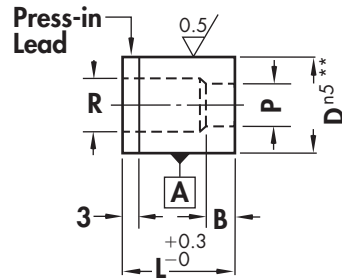
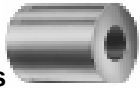
Steel

Standard Alterations

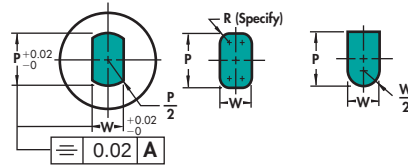


Headless — ISO 8977 (Round Only)

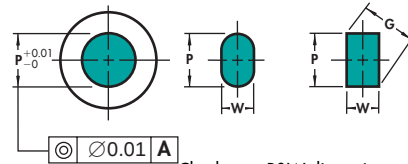
Type
AD_
Headless



ADH ADK ADJ



ADX ADO ADR



Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown.

$$G = \sqrt{P^2 + W^2}$$

Body D	Std. S	B Alt. A	Alt. B	Type & D	Round Range P	Type & D	Shape Min. W	Max. P/G	R	L						
										20	22	25	28	30	32	35
08	4	—	—	ADX08	1.50- 2.40	—	—	—	3.5	•	•	•	•	•	•	•
	4	—	—	ADX08	2.41- 3.00	—	—	—	4.0	•	•	•	•	•	•	•
	4	8	—	ADX08	3.01- 3.20	—	—	—	4.0	•	•	•	•	•	•	•
10	4	—	—	ADX10	1.50- 2.40	AD_10	—	—	3.5	•	•	•	•	•	•	•
	4	—	—	ADX10	2.41- 3.00	AD_10	—	—	4.0	•	•	•	•	•	•	•
	4	8	—	ADX10	3.01- 3.20	AD_10	1.20- 3.20	—	4.0	•	•	•	•	•	•	•
	4	8	—	ADX10	3.21- 5.00	AD_10	1.20- 5.00	—	6.0	•	•	•	•	•	•	•
13	5	—	—	ADX13	1.50- 2.40	AD_13	—	—	3.5	•	•	•	•	•	•	•
	5	—	—	ADX13	2.41- 3.00	AD_13	—	—	4.0	•	•	•	•	•	•	•
	5	8	—	ADX13	3.01- 3.20	AD_13	—	—	4.0	•	•	•	•	•	•	•
	5	8	—	ADX13	3.21- 5.00	AD_13	2.00- 5.00	—	6.0	•	•	•	•	•	•	•
	5	8	—	ADX13	5.01- 7.20	AD_13	2.00- 7.20	—	8.0	•	•	•	•	•	•	•
16	5	8	—	ADX16	5.00- 7.20	AD_16	2.40- 7.20	—	8.0	•	•	•	•	•	•	•
	5	8	—	ADX16	7.21- 8.80	AD_16	2.40- 8.80	—	9.5	•	•	•	•	•	•	•
20	5	12	20	ADX20	7.00- 8.80	AD_20	3.20- 8.80	—	9.5	•	•	•	•	•	•	•
	5	12	20	ADX20	8.81-11.00	AD_20	3.20-11.00	—	12.0	•	•	•	•	•	•	•
22	6	12	20	ADX22	9.00-14.00	AD_22	4.00-14.00	—	15.0	•	•	•	•	•	•	•
25	6	12	20	ADX25	11.00-14.00	AD_25	4.80-14.00	—	15.0	•	•	•	•	•	•	•
	6	12	20	ADX25	14.01-16.50	AD_25	4.80-16.50	—	17.5	•	•	•	•	•	•	•
32	6	12	20	ADX32	13.00-16.50	AD_32	5.50-16.50	—	17.5	•	•	•	•	•	•	•
	6	12	20	ADX32	16.51-20.00	AD_32	5.50-20.00	—	21.0	•	•	•	•	•	•	•
38	8	12	20	ADX38	16.00-20.00	AD_38	6.40-20.00	—	21.0	•	•	•	•	•	•	•
	8	12	20	ADX38	20.01-26.00	AD_38	6.40-26.00	—	27.0	•	•	•	•	•	•	•
40	8	12	20	ADX40	16.00-20.00	AD_40	6.40-20.00	—	21.0	•	•	•	•	•	•	•
	8	12	20	ADX40	20.01-26.00	AD_40	6.40-26.00	—	27.0	•	•	•	•	•	•	•

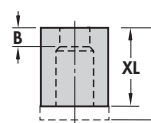
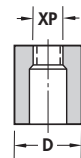
Standard Alterations for AD and CD (page 17) Matrixes

Standard Alterations are beyond those sizes listed above and can be manufactured for a slight additional charge.

Press-Fit AD_					Ball Lock CD_			
D	Min. P	Min. W	Max. P/G	R	Min. P	Min. W	Max. P/G	Max. R
10	1.5*	1.2	5.5	6.0	—	—	—	—
13	1.5*	1.2	7.5	8.0	—	1.2	6.3	7.1
16	3.0	2.0	9.0	9.5	—	1.6	8.8	9.5
20	5.0	2.4	11.5	12.0	3.8	2.4	11.9	12.7
22	7.0	3.2	14.5	15.0	—	—	—	—
25	9.0	4.0	17.0	17.5	5.1	4.0	16.5	17.5
32	11.0	4.8	20.5	21.0	6.4	4.8	21.4	22.2
38	13.0	5.5	26.5	27.0	7.6	5.5	28.0	28.7
40	13.0	5.5	26.5	27.0	—	—	—	—
45	16.0	6.4	35.0	36.0	—	—	—	—
50	19.0	8.0	40.0	41.0	—	—	—	—
56	22.0	9.0	45.0	46.0	—	—	—	—
63	25.0	10.0	50.0	51.0	—	—	—	—
71	28.0	11.0	56.0	57.0	—	—	—	—
76	31.0	12.0	60.0	61.0	—	—	—	—
85	39.0	15.0	66.0	67.0	—	—	—	—
90	43.0	21.0	70.0	71.0	—	—	—	—
100	45.0	25.0	78.0	79.0	—	—	—	—

*3.00 min. P at 8mm Land Length

XP, XW P or W Dimensions Larger or Smaller than Standard

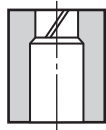


XL Overall-Length Shortened
Stock removal does not alter B length.
Minimum overall length = 13.

LL Precision Overall-Length
Same as XL except overall length is held to ±0.02.

AD Matrixes conform to **NAAMS™ standard for Straight Relief Die Buttons. For diameters 32-100 add XDT-j6 to the end of the catalog number to receive **NAAMS™** standard j6 tolerance for large diameters.

Body D	Std. S	B Alt. A	Alt. B	Type & D	Round Range P	Type & D	Shape Min. Max. W P/G	R	L						
									22	25	28	30	32	35	40
45	8	12	20	ADX45	19.00-26.00	AD_45	8.00-26.00	27.0	•	•	•	•	•	•	•
	8	12	20	ADX45	26.01-35.00	AD_45	8.00-35.00	36.0	•	•	•	•	•	•	•
50	8	12	20	ADX50	22.00-26.00	AD_50	— —	27.0	•	•	•	•	•	•	•
	8	12	20	ADX50	26.01-35.00	AD_50	9.00-35.00	36.0	•	•	•	•	•	•	•
	8	12	20	ADX50	35.01-40.00	AD_50	9.00-40.00	41.0	•	•	•	•	•	•	•
56	8	12	20	ADX56	25.00-35.00	AD_56	10.00-35.00	36.0	•	•	•	•	•	•	•
	8	12	20	ADX56	35.01-40.00	AD_56	10.00-40.00	41.0	•	•	•	•	•	•	•
	8	12	20	ADX56	40.01-45.00	AD_56	10.00-45.00	46.0	•	•	•	•	•	•	•
63	8	12	20	ADX63	28.00-35.00	AD_63	— —	36.0	•	•	•	•	•	•	•
	8	12	20	ADX63	35.01-40.00	AD_63	11.00-40.00	41.0	•	•	•	•	•	•	•
	8	12	20	ADX63	40.01-45.00	AD_63	11.00-45.00	46.0	•	•	•	•	•	•	•
	8	12	20	ADX63	45.01-50.00	AD_63	11.00-50.00	51.0	•	•	•	•	•	•	•
71	8	12	20	ADX71	31.00-40.00	AD_71	12.00-40.00	41.0	•	•	•	•	•	•	•
	8	12	20	ADX71	40.01-45.00	AD_71	12.00-45.00	46.0	•	•	•	•	•	•	•
	8	12	20	ADX71	45.01-50.00	AD_71	12.00-50.00	51.0	•	•	•	•	•	•	•
	8	12	20	ADX71	50.01-56.00	AD_71	12.00-56.00	57.0	•	•	•	•	•	•	•
76	8	12	20	ADX76	39.00-45.00	AD_76	15.00-45.00	46.0		•	•	•	•	•	•
	8	12	20	ADX76	45.01-50.00	AD_76	15.00-50.00	51.0		•	•	•	•	•	•
	8	12	20	ADX76	50.01-56.00	AD_76	15.00-56.00	57.0		•	•	•	•	•	•
	8	12	20	ADX76	56.01-60.00	AD_76	15.00-60.00	61.0		•	•	•	•	•	•
85	8	12	20	ADX85	43.00-50.00	AD_85	21.00-50.00	51.0		•	•	•	•	•	•
	8	12	20	ADX85	50.01-56.00	AD_85	21.00-56.00	57.0		•	•	•	•	•	•
	8	12	20	ADX85	56.01-60.00	AD_85	21.00-60.00	61.0		•	•	•	•	•	•
	8	12	20	ADX85	60.01-66.00	AD_85	21.00-66.00	67.0		•	•	•	•	•	•
90	8	12	20	ADX90	45.00-50.00	AD_90	25.00-50.00	51.0		•	•	•	•	•	•
	8	12	20	ADX90	50.01-56.00	AD_90	25.00-56.00	57.0		•	•	•	•	•	•
	8	12	20	ADX90	56.01-60.00	AD_90	25.00-60.00	61.0		•	•	•	•	•	•
	8	12	20	ADX90	60.01-66.00	AD_90	25.00-66.00	67.0		•	•	•	•	•	•
	8	12	20	ADX90	66.01-70.00	AD_90	25.00-70.00	71.0		•	•	•	•	•	•
100	8	12	20	ADX100	50.00-56.00	AD_100	33.00-56.00	57.0		•	•	•	•	•	•
	8	12	20	ADX100	56.01-60.00	AD_100	33.00-60.00	61.0		•	•	•	•	•	•
	8	12	20	ADX100	60.01-66.00	AD_100	33.00-66.00	67.0		•	•	•	•	•	•
	8	12	20	ADX100	66.01-70.00	AD_100	33.00-70.00	71.0		•	•	•	•	•	•
	8	12	20	ADX100	70.01-78.00	AD_100	33.00-78.00	79.0		•	•	•	•	•	•



XSC Slug Control eliminates slug pulling
Dayton Slug Control is as easy as specifying a catalog number. Add the information that is unique to your application to the matrix catalog number. See ordering information.

Dayton Slug Control is Easy to Order

Dayton Slug Control is as easy as specifying a catalog number. Add the information that is unique to your application to the matrix catalog number. See the example below:

You must specify **XSC** for alteration, **material thickness** and **clearance per side** as a percent.

Catalog Number				Your Specs		
ADX	13	25	P7.0	XSC	MM0.3	CS5
Type	D	L	P	Alt. Code	Mat'l Th'kness (inches)	Clear Per Side (%)

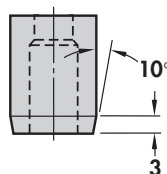
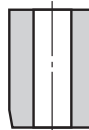
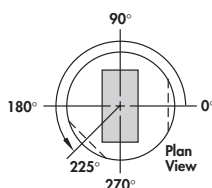
This information will be entered into our computer to generate a program to alter the land of the matrix and end your slug pulling problems forever! Call us or contact your Dayton distributor for more information.

Standard Key Flat Location

Standard Key Flat Location is 0°. Alternative locations of 90°, 180°, or 270° can be specified at *no additional cost*.

Custom Key Flat Location

Custom Key Flat Locations can be specified as degree required counterclockwise from 0°. See page 20 for more details.

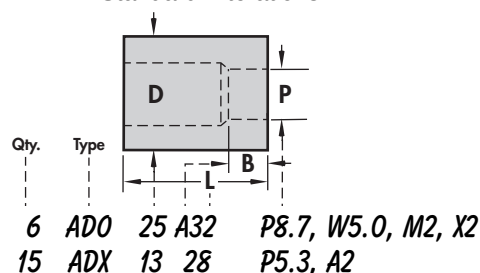


XAL 10° Angled Lead on AD_ The angle provides clearance for steps left by CNC machining.

Standard on AN_-Matrixes

How to Order:

Specify: Quantity
Type
Body Dia. & B and Overall Length Codes
P or P & W Dimensions
Standard Alterations



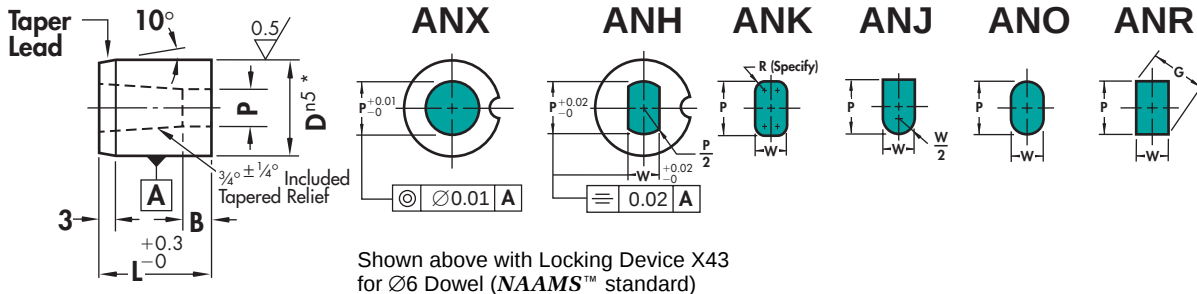
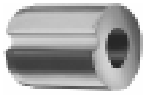
Tapered Relief Matrixes

Steel	HRC
A2	60-63

For automotive CNC build applications

Ordering Example: ANO 25 A32 P8.7 W5.0 X43

Type
AN_



Shown above with Locking Device X43
for Ø6 Dowel (NAAMS™ standard)

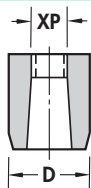
Check your P&W dimensions to be sure the
diagonal G does not exceed the max. shown.

$$G = \sqrt{P^2 + W^2}$$

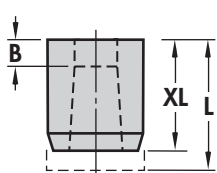
See page 20 for other Locking Devices (must be specified)

Body D	Std. S	B Alt. A	Alt. B	Type & D	Round Range P	Type & D	Shape Min. Max. W P/G	L									
								13	16	20	22	25	28	30	32	35	40
10	4	5	3	ANX10	1.60- 6.80	AN_10	1.30- 6.80	•	•	•	•	•	•	•	•	•	•
13	5	8	3	ANX13	3.00- 8.80	AN_13	1.90- 8.80	•	•	•	•	•	•	•	•	•	•
16	5	8	3	ANX16	7.40-10.80	AN_16	1.90-10.80			•	•	•	•	•	•	•	•
20	5	10	3	ANX20	9.50-13.60	AN_20	1.90-13.60			•	•	•	•	•	•	•	•
22	6	10	3	ANX22	10.50-15.00	AN_22	1.90-15.00			•	•	•	•	•	•	•	•
25	6	10	3	ANX25	12.00-17.00	AN_25	1.90-17.00			•	•	•	•	•	•	•	•
32	6	12	3	ANX32	16.00-22.00	AN_32	1.90-22.00			•	•	•	•	•	•	•	•
38	8	12	3	ANX38	18.00-27.00	AN_38	1.90-27.00			•	•	•	•	•	•	•	•
40	8	12	3	ANX40	18.00-27.00	AN_40	1.90-27.00			•	•	•	•	•	•	•	•
45	8	12	3	ANX45	18.00-35.00	AN_45	2.40-35.00				•	•	•	•	•	•	•
50	8	12	3	ANX50	18.00-40.00	AN_50	4.00-40.00				•	•	•	•	•	•	•
56	8	12	3	ANX56	18.00-45.00	AN_56	4.00-45.00				•	•	•	•	•	•	•
63	8	12	3	ANX63	18.00-50.00	AN_63	4.00-50.00				•	•	•	•	•	•	•
71	8	12	3	ANX71	18.00-56.00	AN_71	4.00-56.00				•	•	•	•	•	•	•
76	8	12	3	ANX76	25.00-60.00	AN_76	5.60-60.00					•	•	•	•	•	•
85	8	12	3	ANX85	25.00-66.00	AN_85	5.60-66.00					•	•	•	•	•	•
90	8	12	3	ANX90	32.00-70.00	AN_90	5.60-70.00					•	•	•	•	•	•
100	8	12	3	ANX100	32.00-78.00	AN_100	5.60-78.00					•	•	•	•	•	•

Standard Alterations for AN Matrixes

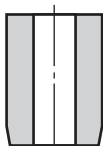


XP, XW P or W Dimensions
Larger or Smaller
than Standard

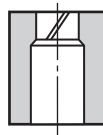


XL Overall-Length
Shortened
Minimum overall
length = 13.

LL Precision Overall-Length
Same as XL except overall
length is held to ±0.02.



XBL Straight Through Land
The land length (B) equals the
overall length of the matrix.
Can be used for bushings,
guides and a variety of
other applications.



XSC Slug Control eliminates slug pulling
Dayton Slug Control is as easy as specifying
a catalog number. Add the information that
is unique to your application to the matrix
catalog number. See ordering information.
Available on all AN matrixes.
See page 25 for more information.

Dayton Slug Control is Easy to Order

Dayton Slug Control is as easy as specifying a catalog
number. Add the information that is unique to your application
to the matrix catalog number. See the example below:

You must specify **XSC** for alteration, **material thickness** and
clearance per side as a percent.

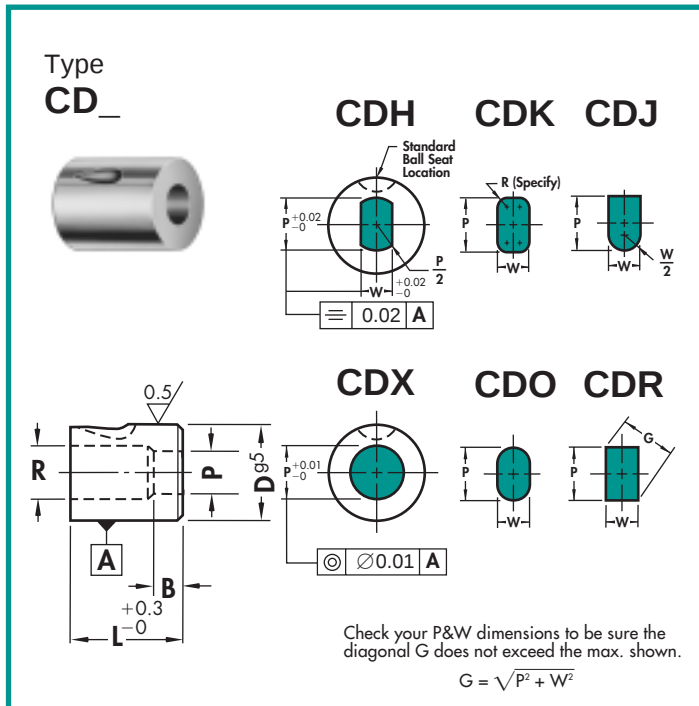
Catalog Number				Your Specs		
ANX	25	A32	P12.0	XSC	MM0.3	CS5
Type	D	L	P	Alt. Code	Mat'l Th'kness	Clear Per Side (%)

This information will be entered into our computer to generate
a program to alter the land of the matrix and end your slug
pulling problems forever! Call us or contact your Dayton
distributor for more information.

Light Duty Ball Lock Matrixes

Steel:	HRC
A2	60-63

Ordering Example: *CD0 25 32 P8.7 W5.0*



Standard Ball Seat Locations

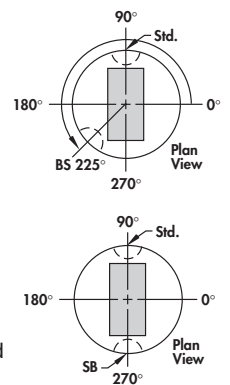
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180°, or 270° can be specified at *no additional cost*.

Custom Ball Seat Locations

Custom Ball Seat Locations can be specified as BS and degrees counter-clockwise from 0°.

Double Ball Seat Locations

A second ball seat can be specified. Normally located 180° from the primary ball seat these are used to minimize sharpening of matrixes in notching operations by rotating 180°. Specify SB and degree desired. Can also be located 90° from primary ball seat.



Body Dia. D	B	Max. R	Type & D	Range P	Type & D	Min. W	Max. P/G	L 32
13	4	6.0	CDX13	1.50- 5.00	CD_13	1.20- 5.00		•
16	5	8.0	CDX16	3.20- 7.20	CD_16	2.00- 7.20		•
20	5	12.0	CDX20	4.00-11.00	CD_20	2.40-11.00		•
25	6	16.0	CDX25	8.00-15.00	CD_25	4.00-15.00		•
32	6	20.0	CDX32	11.00-19.00	CD_32	4.80-19.00		•
38	8	27.0	CDX38	16.50-26.00	CD_38	6.40-26.00		•

EDM Matrix Blanks

Steel	HRC
A2, M2	60-63

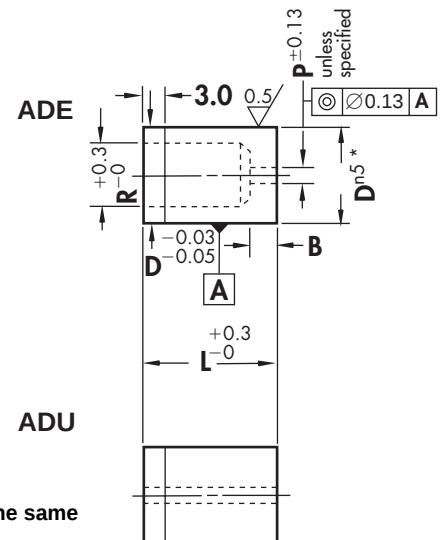
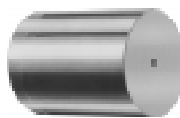
How to Order:

Specify: Quantity
Type
Body Dia. & Length Codes
B&P Dimensions if Required

8 ADE 40-A35 M2
2 ADU 13-30 A2

For the fastest delivery use the hole (P) dimensions given in the chart. If a larger hole is desired simply specify "XP" and give the dimension.

Type ADE/ADU



Dimensions and tolerances are the same as ADE

Type	Body D	P	ADE			ADE R	L							
			Std. S	B Alt. A	Alt. B		20	22	25	28	30	32	35	40
ADE ADU	8	0.8	—	—	—	—	•	•	•	•	•	•	•	•
	10	0.8	4	8	—	6.0	•	•	•	•	•	•	•	•
	13	1.6	5	8	—	8.0	•	•	•	•	•	•	•	•
	16	1.6	5	8	—	9.5	•	•	•	•	•	•	•	•
	20	1.6	5	12	20	12.0	•	•	•	•	•	•	•	•
	22	1.6	6	12	20	15.0	•	•	•	•	•	•	•	•
	25	1.6	6	12	20	17.5	•	•	•	•	•	•	•	•
	32	1.6	8	12	20	21.0	•	•	•	•	•	•	•	•
	38	1.6	8	12	20	27.0	•	•	•	•	•	•	•	•
	40	1.6	8	12	20	27.0	•	•	•	•	•	•	•	•
	45	3.2	8	12	20	36.0	•	•	•	•	•	•	•	•
	50	3.2	8	12	20	41.0	•	•	•	•	•	•	•	•
	56	3.2	8	12	20	46.0	•	•	•	•	•	•	•	•
	63	3.2	8	12	20	51.0	•	•	•	•	•	•	•	•
	71	3.2	8	12	20	57.0	•	•	•	•	•	•	•	•
	76	3.2	8	12	20	61.0	•	•	•	•	•	•	•	•
	85	3.2	8	12	20	67.0	•	•	•	•	•	•	•	•
	90	3.2	8	12	20	71.0	•	•	•	•	•	•	•	•
	100	3.2	8	12	20	79.0	•	•	•	•	•	•	•	•

*For diameters 32-100 add XDT-j6 to the end of the catalog number to receive *NAAMS*™ standard j6 tolerance for large diameters.

Classified Shapes

Standard Ball Seat Locations

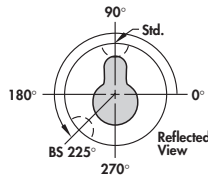
The Standard Ball Seat location is at 90°. Alternative locations of 0°, 180° or 270° can be specified *at no extra cost*.

Custom Ball Seat Locations

Custom Ball Seat locations can be specified as BS and degrees counterclockwise from 0°.

Views

Views are: reflected view of punch and plan view of matrix.



Corner Dimensions

Dimensions should be to the theoretical sharp corners for C22, C24, C25, C34, C61 and C88. Some reduction of these dimensions will result from fitting the punch and matrix under conditions where clearance is 0.04 or less per side.

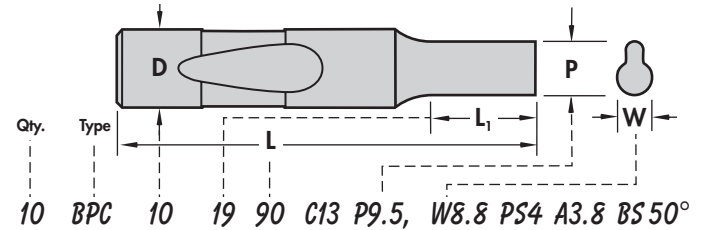
Fillets matched with sharp corners reduces the clearance per side (Δ). If the clearance is 0.04Δ or less, DAYTON will break sharp corners when the punches and matrixes are ordered together. This reduces assembly time and the risk of the edge breaking during operation. All back-holes are counterbored.

Shape Centers

Shapes are centered on punch shanks as shown. Shaped in matrixes are also centered as shown with the exception of shapes **C22** and **C34**. Due to the clearance, the P dimension on these shapes will not be centered.

How to Order:

Specify: Quantity
Catalog Number
Classified Shape
Code
Point or Hole Dimensions



Example: Matrixes
10 ADC 20 30 C13 P9.5 W8.8 A3.8 M2 $\Delta 0.1$ X73 50°

Clearance

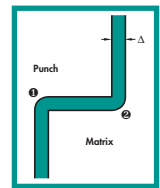
To assure proper relationship with punches, it is necessary to specify punch dimensions and clearance per side (Δ) when ordering matrixes.

DAYTON will assure the proper clearance of matrixes to the punch when ordered in this manner.

Notes ① and ② — Fillets and Sharp Corners

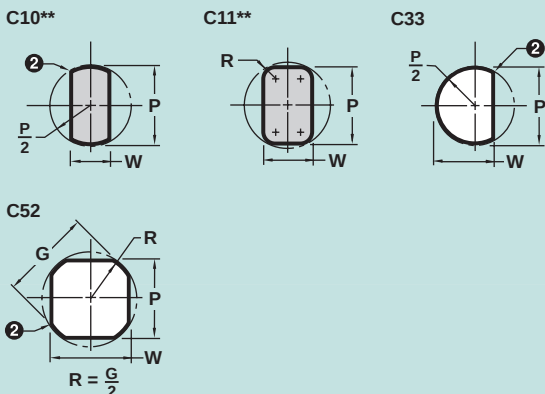
Normal grinding methods produce:

- ① 0.2 max fillet on the punch... matching corner sharp on the matrix.
- ② 0.2 max fillet on the matrix... matching corner sharp on the punch.

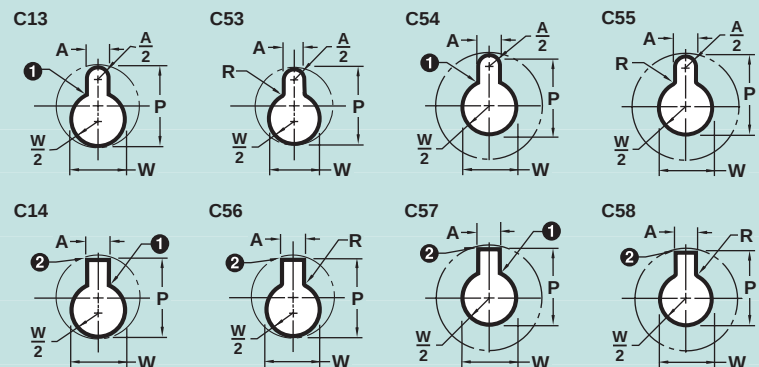


Simplified Specifications...83 Common Shapes—No Detailing Required

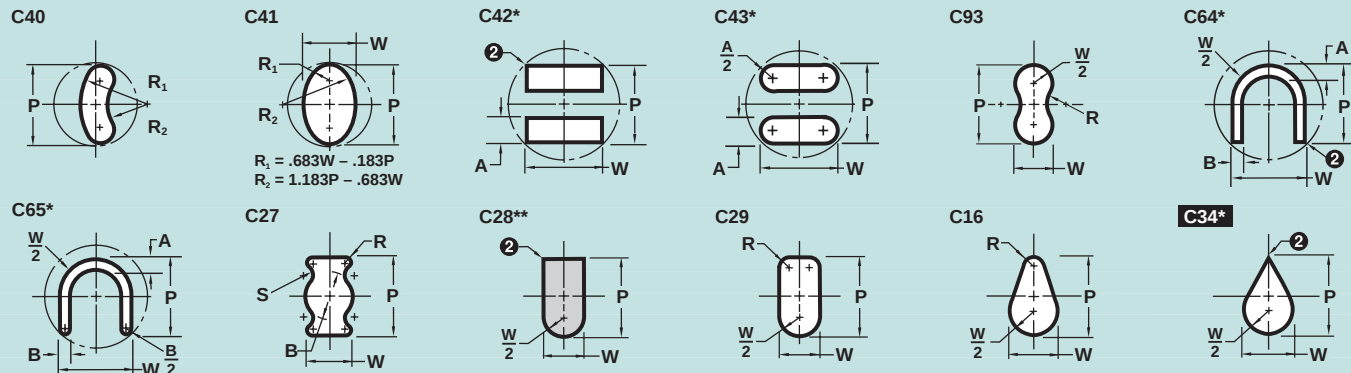
Flatted Rounds



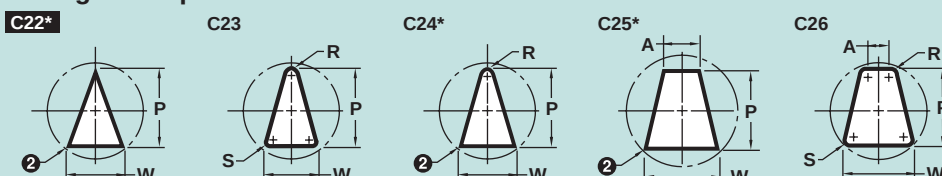
Mono Lobes



Miscellaneous



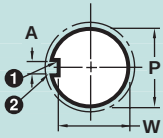
Triangles/Trapezoids



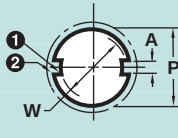
**Now a standard shape.
See product pages.

Keys

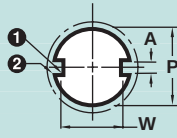
C30



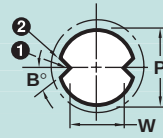
C31



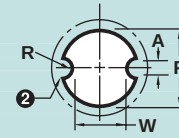
C32



C61

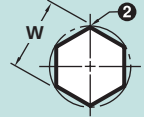


C62

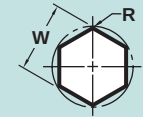


Polygons

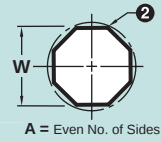
C12



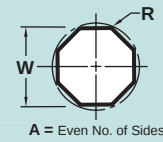
C85



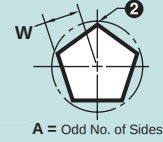
C35



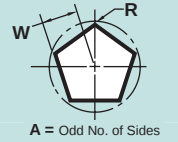
C86



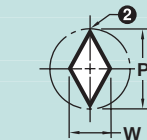
C36



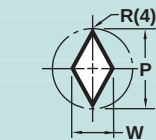
C87



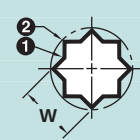
C88



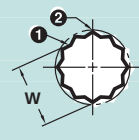
C89



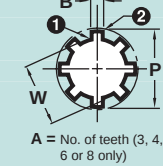
C37



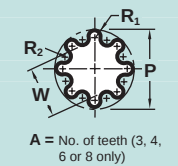
C38



C39

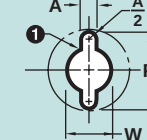


C90*

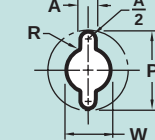


Multi Lobes

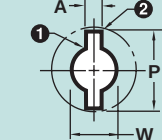
C19



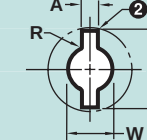
C59



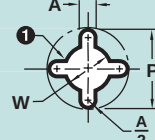
C20



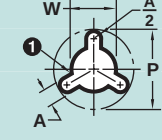
C60



C17

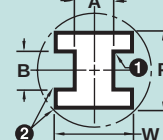


C18

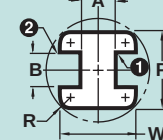


Duo Tees

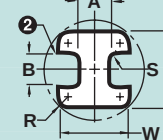
C21*



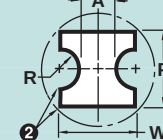
C91*



C92

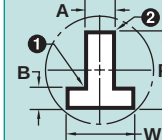


C15*

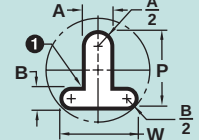


T's

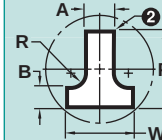
C44*



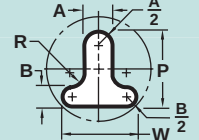
C66*



C45*

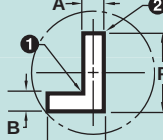


C67*

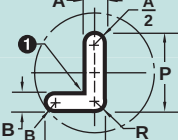


L's

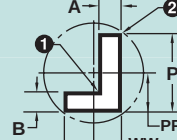
C46*



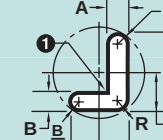
C77*



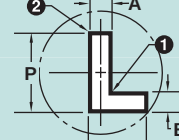
C78*



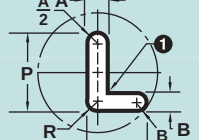
C79*



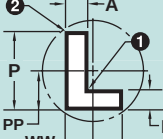
C48*



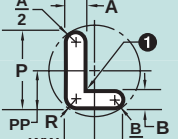
C80*



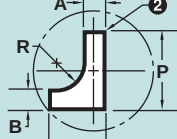
C81*



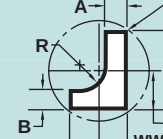
C82*



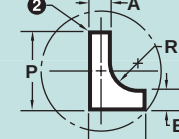
C47*



C83*



C49*

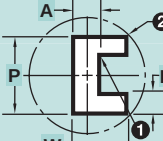


C84*

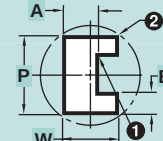


U's

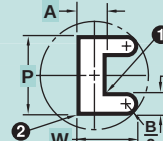
C50*



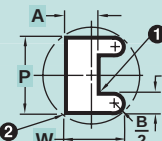
C68*



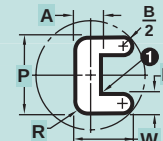
C69*



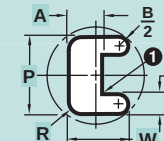
C70*



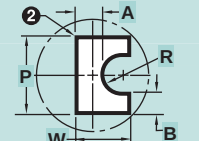
C71*



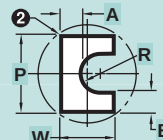
C72*



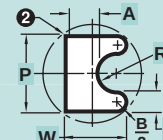
C51*



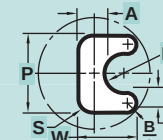
C73*



C74*



C75*



C76*



*Avoid excessive overhang by specifying shaped back-hole on AD_ and CD_ or use AN_ Matrixes.

Locking Devices

How to Order:

5 ADO 40 30 P16, W6.4, X20
9 ADR 100 35 P75, W50, X83

Standard/ Alternate Locations

Definitions:

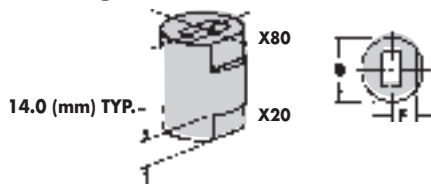
Standard Location is at 0°.
Alternate Location is 90°, 180° or 270°. Alternate Locations are available at no additional charge.

Custom Locations

Definition:

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

Single and Double Flats



Headless Matrixes: X20, X80, X50, X90

Body Ø ▶	08	10	13	16	20
F	3.5	4.0	5.5	7.0	8.5
Body Ø ▶	22	25	32	38	40
F	9.5	11.0	14.0	17.0	18.0
Body Ø ▶	45	50	56	63	71
F	20.5	23.0	26.0	29.5	33.5
Body Ø ▶	76	85	90	100	
F	35.5	40.0	42.5	47.5	

Single Flats: X2, X20, X80

Locking Devices	Matrix
X20	Bottom
X80	Top

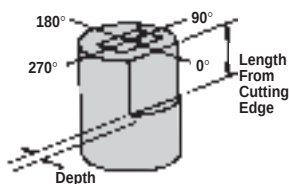
Order Example:
X20 - 90°

Single Flats: X5, X50, X90

Locking Devices	Matrix
X50	Bottom
X90	Top

Order Example:
X50 - 135°

Additional Flats



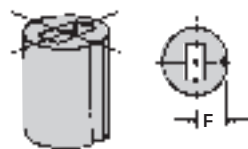
Additional Flats

Code	Depth	Length
X81	1.5	13
X82	1.5	16
X83	1.5	20
X84	1.5	Full Length
X85	2.5	13
X86	2.5	16
X87	2.5	20
X88	2.5	Full Length
X89	Specify Dimensions	

Additional Flats

Code	Depth	Length
X91	1.5	13
X92	1.5	16
X93	1.5	20
X94	1.5	Full Length
X95	2.5	13
X96	2.5	16
X97	2.5	20
X98	2.5	Full Length
X99	Specify Dimensions	

Dowel Slots



Dowel Slots: X0, X4, X41 & X43

Locking Devices	Dowel Ø
X0	3
X4	3
X41	4
X43	6

Order Example:
X0 - 180°

Dowel Slots: X1, X7, X71 & X73

Locking Devices	Dowel Ø
X1	3
X7	3
X71	4
X73	6

Order Example:
X71 - 135°

Dowel Slot F Dimension for Headless Matrixes Only

Body Ø ▶	08	10	13	16-25	32-100
X0/X1	.5D	.5D	.5D	.5D	.5D
X4/X7	4.7	5.5	6.7	.5D	.5D
X41/X71	5.2	6.0	7.2	.5D	.5D
X43/X73	6.2	7.0	8.2	.5D+1.0	.5D

Key Flats vs. Dowel Slots

Maximum hole dimensions in matrixes were designed with key flats in mind. There are instances where, if using a dowel slot, the dowel hole could break into the relief. For this reason there are two ways to specify the location of the dowel. **X0** (standard/alternate location) and **X1**

(custom location) are located .5D from centerline. However, when hole dimensions are approaching the high limit of "P" **X4** (standard/alternate location) or **X7** (custom location) may be specified. This relocates the dowel outward to assure no interference between the dowel and relief.



BRA
For Heavy Duty Punches

Change Retainers

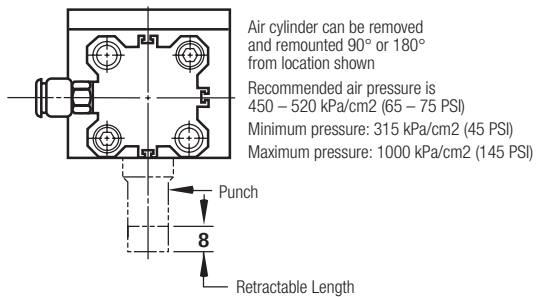
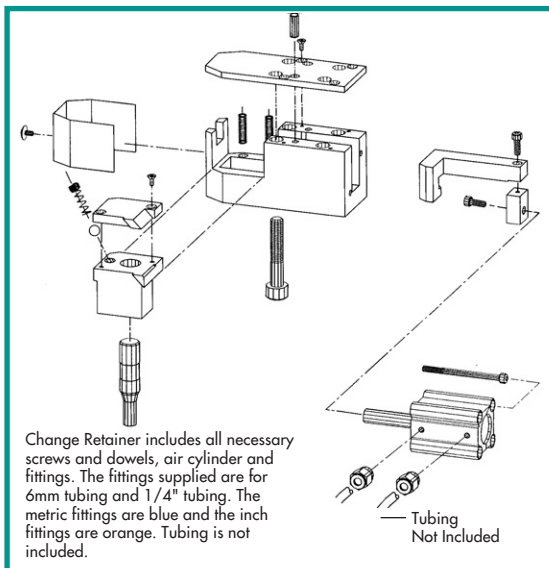
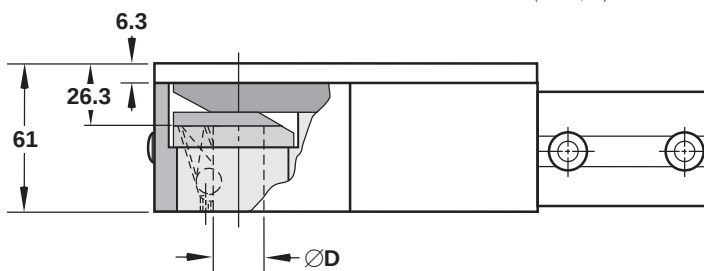
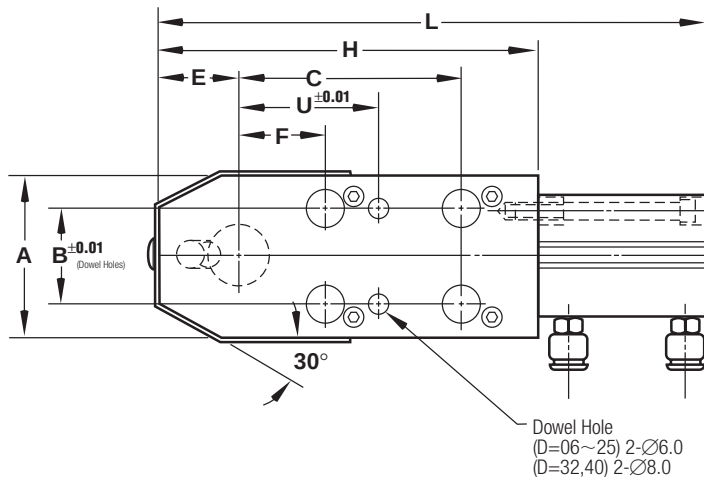
Air Cylinder Type

— For Ball Lock Punches

Engage or disengage punches in seconds

Change Retainers are used where different hole patterns are required. Various hole patterns can be accomplished without the need for multiple dies. Different parts, such as right and left hand can be run in one die.

Changing hole patterns takes only minutes, sometimes only seconds. A bar holding the punch in position is released to allow the punch to retract up far enough to avoid contact with the material.



How To Order:

Quantity Catalog No.
6 BRA20

Catalog Number		D	L	A	B	C	E	F	H	U	Screw Size
Heavy Duty	Code										
BRA	10	10.0	172	46	30	—	32	21	114	37	M8
BRA	13	13.0	183	50	30	—	34	25	120	41	M10
BRA	16	16.0	183	50	30	—	34	25	120	41	M10
BRA	20	20.0	204	58	38	—	37	29	136	45	M10
BRA	25	25.0	204	58	38	—	37	29	136	45	M10
BRA	32	32.0	257	80	56	100	44	38	174	60	M12
BRA	40	40.0	257	80	56	100	44	38	174	60	M12

BRA Change Retainers conform to NAAMS™ standard for Ball Lock Punch Change Retainers

Heavy Duty/Light Duty **TRUE POSITION** Retainers

...The interchangeable retainer that is the industry standard

- The in-line dowel guarantees precise punch-to-matrix alignment. You gain higher quality parts, longer punch life and drastically reduced downtime.
- True-Position retainers eliminate hand fitting and cut mounting time by nearly 50%. Simply pull the retainer from its box and screw it to the die set. True Position retainers give you dimensional accuracy *every* time.
- Shaped punches use the secondary dowel for precise alignment; round punches need only one.
- The precision-ground ball hole assures perfect alignment of *any* punch shape—even if you replace the retainer.
- Tapped ball release hole.
- True Position adaptability can cut your retainer inventory in half.

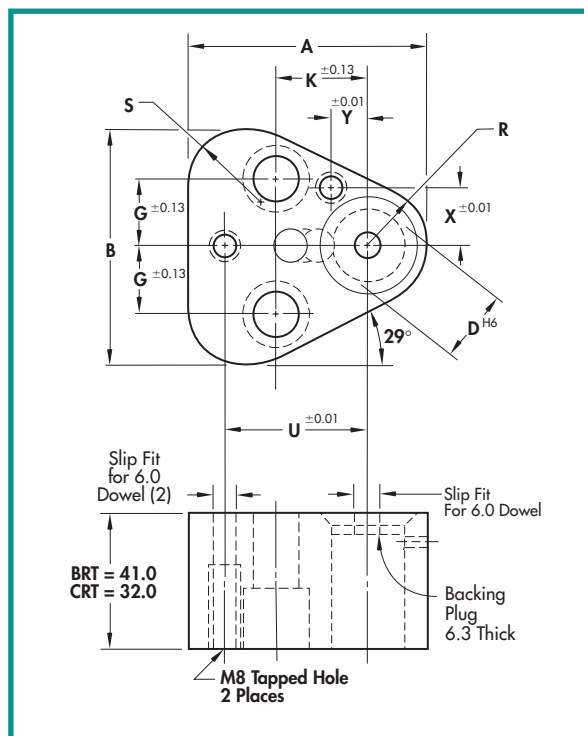


TRUE POSITION Retainer includes:

- 1 Ball • 1 Spring
- 2 Screws
- 2 Threaded Dowels
- 1 Ball Release Screw

How to Order:

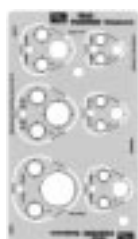
Quantity	Catalog No.
10	BRT10
13	CRT25



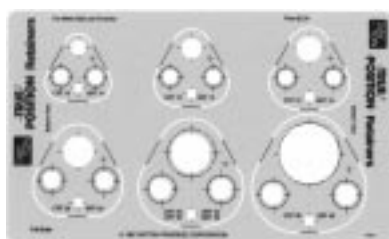
BRT conforms to NAAMS™ standard for Ball Lock Punch Retainer

Catalog Number Heavy Duty	Light Duty	Code	D	A	B	G	K	R	S	U	X	Y	Screw Size
BRT	CRT	10	10.00	44.5	43.7	11.1	19.0	9.5	12.0	26.925	9.0	7.5	M8
BRT	CRT	13	13.00	50.8	50.0	14.3	19.0	12.7	15.2	29.970	12.0	6.5	M8
BRT	CRT	16	16.00	54.0	53.2	15.9	19.0	14.3	16.8	31.750	13.5	6.0	M8
BRT	CRT	20	20.00	60.3	59.5	17.5	19.0	17.5	20.0	33.530	16.5	5.0	M10
BRT	CRT	25	25.00	69.9	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
BRT	CRT	32	32.00	69.9	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
—	CRT	38	38.00	77.4	76.6	24.0	27.0	26.0	28.5	43.993	26.0	10.0	M12
BRT	—	40	40.00	77.4	76.6	24.0	27.0	26.0	28.5	43.993	26.0	10.0	M12

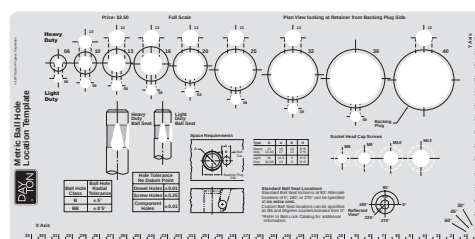
Templates



True Position
Half Scale RD8835

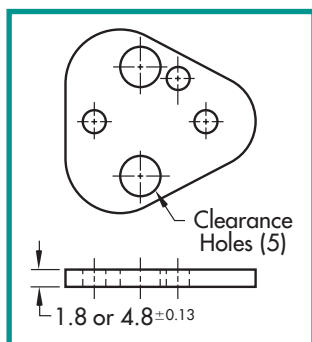


True Position
Full Scale RD 8834



Ball Location
Full Scale AM 9706

Shim Plates



D	1.8 (Soft)	4.8 (Rc55)
10	URSP 10 18	URBP 10 48
13	URSP 13 18	URBP 13 48
16	URSP 16 18	URBP 16 48
20	URSP 20 18	URBP 20 48
25	URSP 25 18	URBP 25 48
32	URSP 32 18	URBP 32 48

Ball Release Tools

Angle Tip
(for all retainers) Cat. No. 818038



Straight Tip
(for all retainers) Cat. No. 818046



Threaded Tip
(for True Position® Retainers) Cat. No. 269999

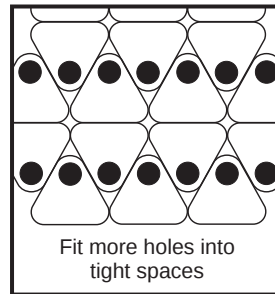


Heavy Duty/Light Duty Ultra-Compact Retainers

Single Ball Lock Compact Retainers

Space-Saving, time-saving retainers for round punches and pilots

- The industry's smallest interchangeable retainer, so you can fit more holes into tight spaces.
- Ultra-Compact retainers eliminate hand fitting and cut mounting time by nearly 50%. simply pull the retainer from its box and screw it to the die set.
- A single dowel in the hardened backing plug is all you need for perfect alignment.
- Tapped ball release hole.
- Also interchangeable with the True Position Retainer.



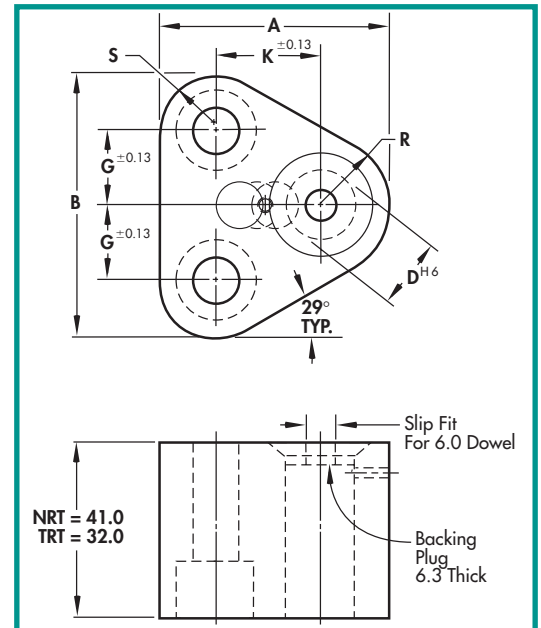
How to Order:

Quantity	Catalog No.
23	NRT10
15	TRT25

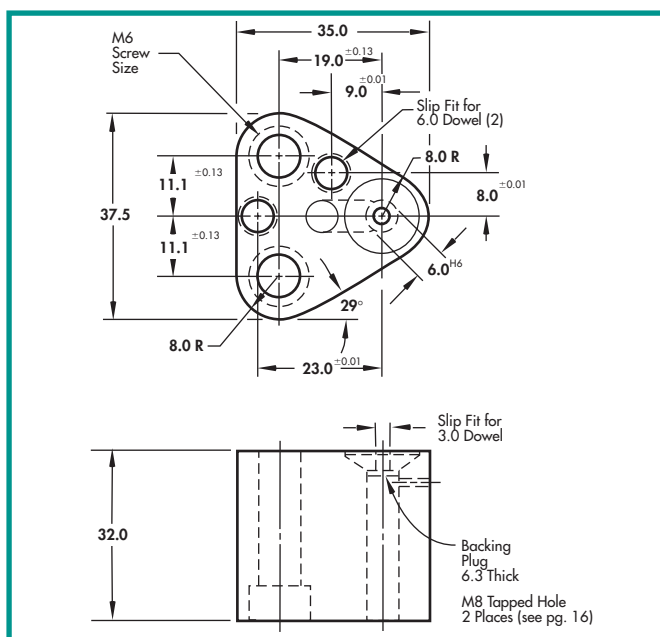


ULTRA COMPACT Retainer includes:

- 1 Ball • 1 Spring • 2 Screws
- 1 Threaded Dowel
- 1 Ball Release Screw



Catalog Number	Heavy Duty	Light Duty	Code	D	A	B	G	K	R	S	Screw Size
NRT	TRT	10	10.00	38.5	40.6	11.1	19.0	9.5	9.5	M8	
NRT	TRT	13	13.00	41.7	47.9	14.3	19.0	12.7	9.5	M8	
NRT	TRT	16	16.00	43.3	51.6	15.9	19.0	14.3	9.5	M8	
NRT	TRT	20	20.00	47.5	57.9	17.5	19.0	17.5	11.0	M10	
NRT	TRT	25	25.00	59.2	68.8	19.8	23.8	22.2	16.5	M12	
NRT	TRT	32	32.00	59.2	68.8	19.8	23.8	22.2	16.5	M12	
NRT	—	40	40.00	69.0	76.5	24.0	27.0	26.0	22.0	M12	



Light Duty Retainer

For Small Holes and Limited Space Applications

- Mounting space required to mount most retainers can be reduced by as much as 47%, eliminating interference problems.
- For piercing tightly spaced holes up to $\varnothing 6$, the TRN solves most mounting problems.



TRN06 Retainer includes:

- 1 Ball • 1 Spring
- 2 Screws
- 2 Threaded Dowels
- 1 Ball Release Screw

How to Order:

Quantity	Catalog No.
12	TRN06

Multi-Position™ Retainers

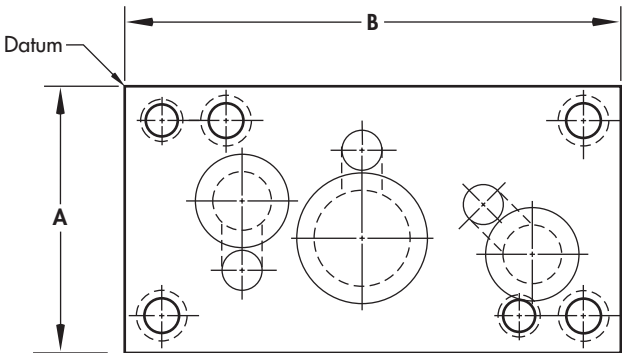
For Ball Lock Punches

BRP Heavy Duty
CRP Light Duty

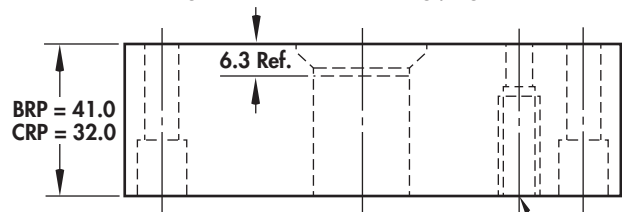


Dayton's innovative Multi-Position retainers provide a simple, low-cost solution to building new dies. These retainers reduce the need for special detailing, save both design and build time.

Multi-Position retainers are easy to order. Simply specify BRP for Heavy Duty or CRP for Light Duty Ball Lock retainers followed by the catalog number, hole locations and hole sizes. (For more information, see How to Order example on the next page.) Order forms are available on request.



Note:
Looking at retainer from backing plug side.



BRP = 41.0
CRP = 32.0

Specify screw and dowel size and location.

Tapped Hole
Under Dowel

Backing Plugs

TYPE A	TYPE B	TYPE C
In-Line Dowel	For Matrixes	Solid
		

The Type C solid backing plug is standard. However, as shown in the photo above left, you can use two Type A plugs with 6.0 diameter dowels for location. This eliminates the cost of dowel holes in the retainer.

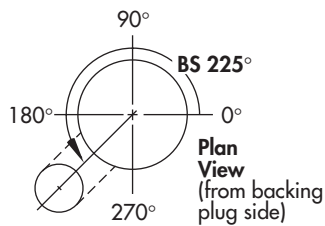
See page 26 to order Backing Plugs.

Matrix Retainers require detailed drawings.

Ø Dowel	3	4	5	6	8	10	12	13	16
Tapped Hole	M5	M6	M8	M8	M10	M14	M14	M16	M20

Type	A	B											
		60	70	80	90	100	125	150	175	200	225	250	300
BRP CRP	50	5060	5070	5080	5090	50100	50125	50150	50175	50200	50225	50250	50300
	60	6060	6070	6080	6090	60100	60125	60150	60175	60200	60225	60250	60300
	70		7070	7080	7090	70100	70125	70150	70175	70200	70225	70250	70300
	80			8080	8090	80100	80125	80150	80175	80200	80225	80250	80300
	100					100100	100125	100150	100175	100200	100225	100250	100300
	125						125125	125150	125175	125200	125225	125250	125300
	150							150150	150175	150200	150225	150250	150300
	200								200175	200200	200225	200250	200300

Ball Hole Locations



Specify radial location in degrees counter-clockwise from 0°.

Hole Locations From Datum	
Dowel Holes	±0.01
Screw Holes	±0.13
Component Holes	±0.01

Punch Shape	Ball Hole Class	Radial Tolerance
Round	B	±5°
Shape	BB	±0°5'

Note: Class B provided unless otherwise specified.

Space Requirements

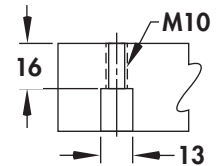
Type	D	A	B	H
BRP	10	15	10	16
	13	17	12	19
	16	17	12	22
	20	17	12	26
	25	17	12	31
	32	17	12	38
CRP	40	17	12	46
	06	11.5	6	12
	10	13	8	16
	13	13	8	19
	16	13	8	22
	20	13	8	26
	25	13	8	31
	32	13	8	38
	38	13	8	44

Tighter spacing can be achieved. When two or more plugs interfere, flats will be ground on the Backing Plugs.

Alterations

Standard Jackscrew Hole

Jackscrews make it easier to pull retainers off the dowels.



Special Size

Any amount of material can be removed from the sides of the retainer for a customer size. Edges are sawcut ±0.8

Clearance Holes

Clearance holes or tapped holes can be detailed or shown in the chart like the order example below.

Holes are drilled through the retainer unless otherwise specified.

Location ±0.3
Diameter +0.4
-0

The following alterations require detail drawings.

Notches

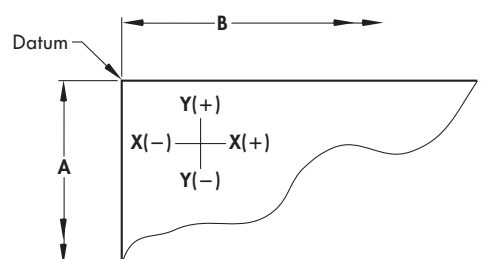
Notches to clear other tooling can be added to any side of the retainer. Notches are sawcut ±0.8

Angles

Angles, like notches can be added to clear other tooling in the die. Angles are sawcut ±0.8

How to Order

Furnish the necessary information as indicated. Order forms for Multi-Position Retainers are available upon request.



Retainer		Catalog No.		Special Size			
☒ BRP ☐ CRP		<u>70175</u>		A _____ B _____			
Multi-Position™ Retainers							
Hole No.	Component		Location		Ball Hole		Backing Plug Type
	Type	Size	X Axis	Y Axis	Location	Class	
1	DOWEL	10.0 S.F.	13.0	−13.0	—	—	—
2	S.H.C.S	M10	35.0	−13.0	—	—	—
3	BJR	16	53.0	−35.0	90°	BB	C
4	CLEAR	Ø33	108.0	−27.0	—	—	—
5	JACKSCR.	STD.	25.0	−25.0	—	—	—

S.F. = Slip Fit

You must specify all dimensions from datum.

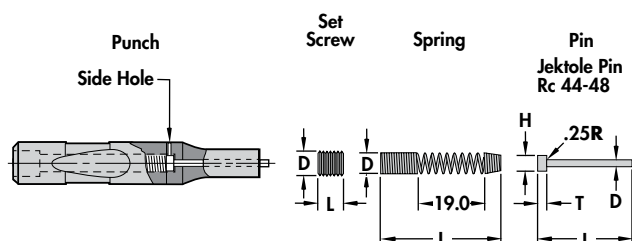
Retainer Accessories

		Catalog Numbers/Sizes														
		BACKING PLUGS			Socket Head Cap Screw	Ball Release Screw	Dowel	Ball	Standard Spring	Extra Heavy Duty Spring	Booster Spring	Retainer Drill Bushing				
		Single Hole Retainers		Multi-Position Retainers												
		Type A	Type B*	Type C												
																
Standard	Optional	Standard														
Heavy Duty BRT  NRT 	10	268488	—	266086	574552 M8x45	268968 M4x12	260037 Ø6x20	268836 Ø10	268976	269018	269026	268372				
	13	268534	—	266094												
	16	268542	—	266108												
	20	268569	—	266116	574597 M10x50			268844 Ø12	268933	269034	269042	268429				
	25	268577	—	266124	574694 M12x50							268437				
	32	268585	—	266132								268445				
	40	268593	—	—								—				
Light Duty CRT  TRT 	10	268488	—	266086	574538 M8x35	268968 M4x12	260037 Ø6x20	268828 Ø8	268909	—	—	268372				
	13	268534	266159	266094												
	16	268542	266167	266108												
	20	268569	266175	266116	574589 M10x40							268429				
	25	268577	266183	266124	574635 M12x40							268437				
	32	268585	266191	266132								268445				
	38	268453	266205	—								—				
TRN	06	268518	—	266078	574511 M6x35	268984 M3x15	574651 Ø3x20 260037 Ø6x20	268801 Ø6	268895	—	—	268275				

*Clearance hole is 0.3 larger than the Max. R for Ball Lock CD_. See chart bottom of page 14, Standard Alterations.

Jektol[®] Data *The Key to Increased Productivity is Jektol Engineered Clearance*

Jektol[®] Components



Universal Jektol Components

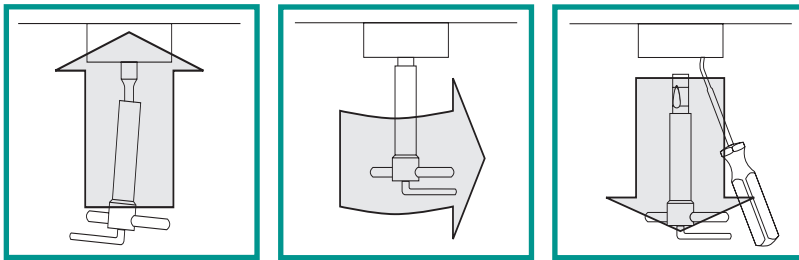
EJECTOR PINS		J2M	J3M	J4M	J6M	J9M	J12M
Overall Length	L	28.0	35.0	49.4	49.0	56.5	56.5
Pin Diameter	D	0.43	0.68	1.04	1.47	2.26	3.05
Head Diameter	H	1.2	1.8	2.4	3.0	4.0	4.8
Head Thickness	T	0.8	1.2	1.6	1.6	2.4	2.4
SPRINGS		J2M	J3M	J4M	J6M	J9M	J12M
Outside Diameter	D	2.1	2.4	3.3	4.3	5.0	7.0
Free Length	L	60.3	60.3	81.0	76.2	68.9	65.1
SCREWS		J2M	J3M	J4M	J6M	J9M	J12M
Screw Size	D	M2.6	M3	M4	M5	M6	M8
Screw Length	L	5	5	5	5	6	6

Jektol Design Limits

DIMENSION		J2M	J3M	J4M	J6M	J9M	J12M
Min. Shank Dia.	D	4.4	5.0	6.8	8.8	10.4	14.0
Min. Point Dia.	P	1.3	2.0	3.0	4.0	6.0	7.2
Max. Point Lgth.		32	38	41	41	41	41
Max. Shank Lgth.	S	87	87	84	84	84	70

Punch Puller

Removes ball lock punches in three quick steps...

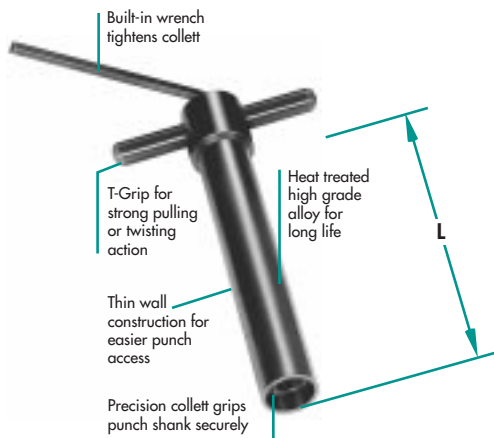


- 1** Slide Punch Puller over the shank.
- 2** Rotate the built-in wrench until tight.
- 3** Insert release tool and pull down.

Remove and replace ball punches in minutes

Dayton Punch Pullers speed and simplify the task of removing ball lock punches from retainers. You no longer have to improvise with vise grips or other tools that can slip from the punch, making removal difficult and sometimes hazardous.

Made of high grade alloy steel, Dayton Punch Pullers are heat treated and precision machined for long, reliable service. Available in shank sizes from 06 to 32. Dayton Punch Pullers will save you time and money



Catalog Number	Shank Diameter	Max. Point Length	L Approx.
818402	06	28	95
818429	10	33	95
818437	13	40	100
818445	16	40	100
818453	20	40	100
818461	25	46	110
818488	32	46	110
818526	Set of 7		

Ball Lock Punch Gage

Dayton Ball Lock Punch Gages are used to check the location of the ball seat. A properly located ball seat assures you that when the punch is inserted into a retainer manufactured to ANSI Standard you will have proper engagement and will have eliminated unsafe locking conditions.

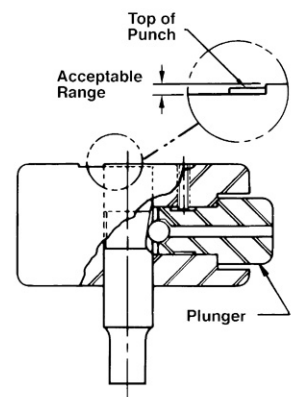
Ball engagement out of the safe locking zone can cause a punch to rotate, pump up and down or even pull out of the retainer, which can lead to costly repair work on the die.

The dimension of the ball seat is not standardized; only the locking function is standardized. All manufacturers of ball locking punches should be using a gage made to ANSI Standard B94.17 to insure their products have a correct ball seat location. With this gage you can check a punch before putting it into the die to guarantee the locking function will not cause any costly downtime.

Heavy Duty	Light Duty	Punch Shank Dia.
—	CGP06	06
BGP10	CGP10	10
BGP13	CGP13	13
BGP16	CGP16	16
BGP20	CGP20	20
BGP25	CGP25	25
BGP32	CGP32	32
—	CGP38	38
BGP40	—	40

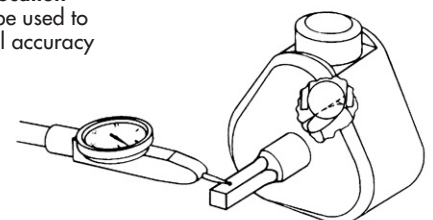
Check Ball Seat

If you have determined the ball seat is in the proper location, but you encounter a problem when in production, the problem is with the retainer.



Check Radial Location

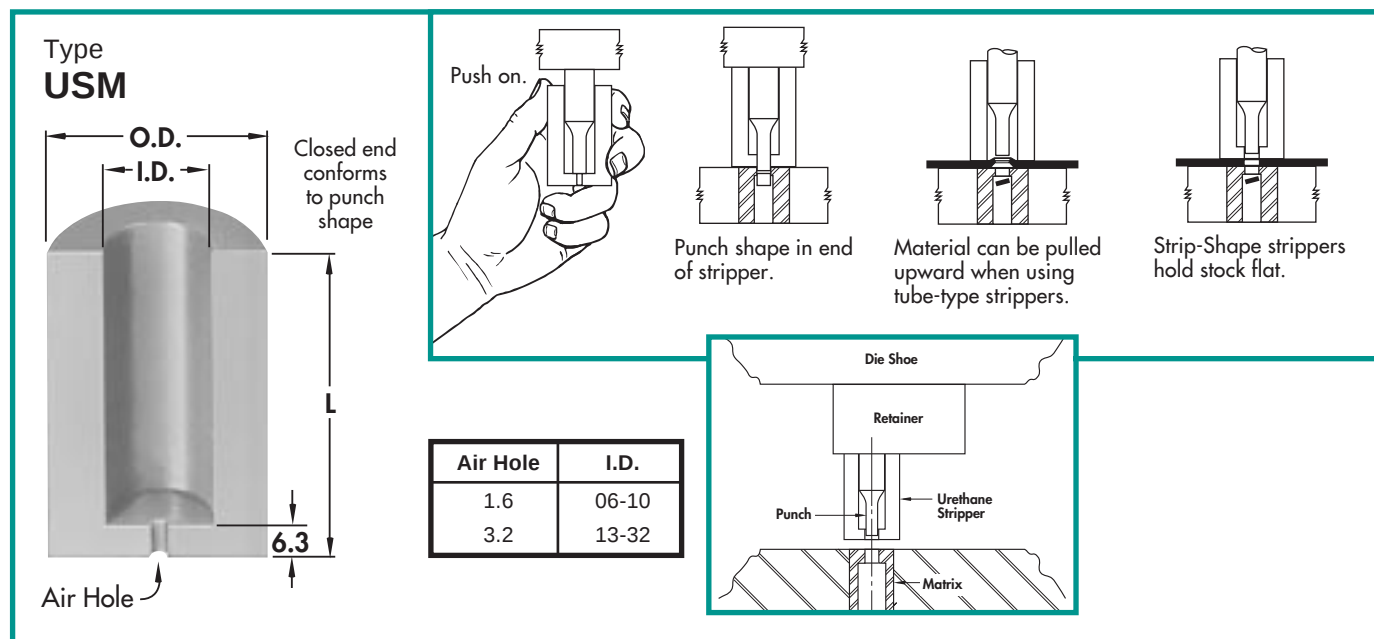
This gage can be used to check the radial accuracy of the ball seat.



Urethane Strippers

Strip-Shape Urethane Strippers assure positive stripping and they guard against punch failure by dampening punch vibration by gripping the punch point. The closed end design holds thin stock flat during the stripping cycle, reducing the potential of rejected parts.

Made from specially formulated urethane resins, these rugged strippers are guaranteed to meet your need for clean, fast, precise stripping action—with all types of punches. Because of Dayton's unique curing agent, Strip-Shape urethane provides greater load bearing capacity than ordinary urethanes. Lot-to-lot pressure ratings are also much more consistent.



I.D.	O.D.	L	Catalog Number	Pressure at Deflection of		
				3.0	6.5	9.5
06	19	45	USM-06-45	1324	2256	—
		53	USM-06-53	1079	1863	2354
		71	USM-06-71	686	1079	1765
08	21	45	USM-08-45	1471	2207	—
		53	USM-08-53	1324	1961	2942
		71	USM-08-71	981	1618	2648
10	23	45	USM-10-45	1716	2795	—
		53	USM-10-53	1422	2452	3187
		56	USM-10-56	1422	2452	3187
		71	USM-10-71	1128	2010	2697
13	26	45	USM-13-45	2109	3334	—
		53	USM-13-53	1471	2354	3432
		56	USM-13-56	1471	2354	2942
		71	USM-13-71	1275	1961	2452

I.D.	O.D.	L	Catalog Number	Pressure at Deflection of		
				3.0	6.5	9.5
16	30	45	USM-16-45	2354	3825	—
		53	USM-16-53	2158	3531	4511
		56	USM-16-56	2158	3531	4511
		71	USM-16-71	1814	2942	3825
20	38	45	USM-20-45	2452	3923	—
		53	USM-20-53	2158	3629	5590
		71	USM-20-71	1618	2942	4658
25	50	45	USM-25-45	9317	14318	—
		53	USM-25-53	7355	11572	15985
		71	USM-25-71	4904	8336	13485

Urethane Hardness: 95 ± 5 Shore A
Max. Recommended Deflection: 15% of Overall Length.
(Pressure Ratings shown in Newtons)

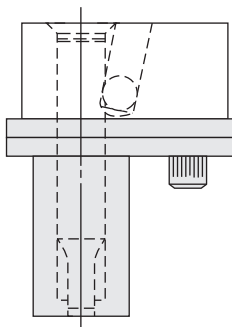
How to Order:

Qty. Catalog No.
10 USM-08-71

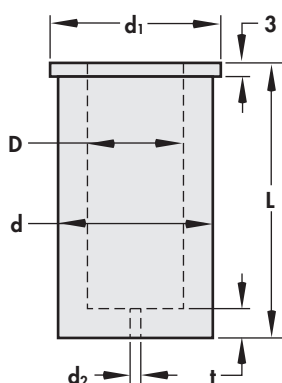
Urethane Stripping Units

Fits retainers with tapped dowel holes only, such as DAYTON retainers: ART, ARTS, BRT, CRT.

When using DAYTON Ball Lock retainers these strippers fit Light Duty punch lengths 71, 80, 90, 100 and Heavy Duty punch lengths 80, 90, 100, 110. On DAYTON Head Type retainers they fit punch lengths 71, 80, 90, 100.



Urethane Strippers UHM

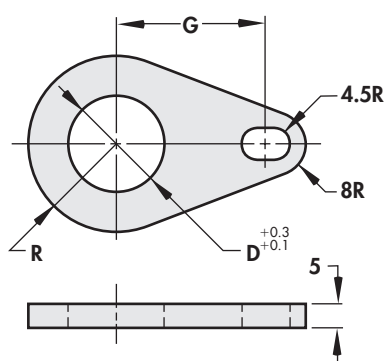


D	d	d ₁	t	d ₂
10	18	21	6	1.6
13	23	26	6	
16	28	31	6	
20	33	36	7	
25	40	43	7	3.0
32	50	55	7	
38	60	65	8	
40	60	65	8	

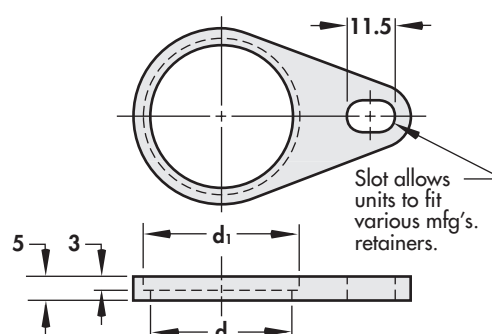
Catalog Number	D	L	Pressure at Deflection of		
			3	6	9
UHM10-43	10	43	1060	1820	—
UHM10-52		52	900	1650	2170
UHM10-63		63	720	1450	1860
UHM10-72		72	570	1280	1610
UHM13-43	13	43	1700	2850	—
UHM13-52		52	1460	2610	3410
UHM13-63		63	1170	2320	2910
UHM13-72		72	930	2080	2500
UHM16-43	16	43	2310	3900	—
UHM16-52		52	1990	3560	4640
UHM16-63		63	1590	3150	3980
UHM16-72		72	1270	2810	3440
UHM20-43	20	43	2900	4900	—
UHM20-52		52	2500	4470	5820
UHM20-63		63	2000	3950	5000
UHM20-72		72	1590	3420	4330
UHM25-43	25	43	4440	7520	—
UHM25-52		52	3810	6860	8780
UHM25-63		63	3050	6050	7680
UHM25-72		72	2420	5390	6780
UHM32-43	32	43	6840	11390	—
UHM32-52		52	5880	10450	13300
UHM32-63		63	4700	9310	11640
UHM32-72		72	3740	8370	10280
UHM38-52	38	52	9480	19330	29720
UHM38-72		72	5950	11630	18160
UHM40-43	40	43	10100	20190	—
UHM40-52		52	8650	17300	25960
UHM40-63		63	6890	13780	20670

Urethane Hardness: 95 ± 5 Shore A
Max. Recommended Deflection: 15% of Overall Length.
(Pressure Ratings shown in Newtons)

Backing Plates UBP



Retaining Plates URP



Catalog No.		D	d	d ₁	R	G	UBP, URB Set EDP No.
Back Plate	Ret. Plate						
UBP10	URP10	10	19	22	13.0	28.0	748579
UBP13	URP13	13	24	27	15.5	31.0	748587
UBP16	URP16	16	29	32	18.0	32.9	748595
UBP20	URP20	20	34	37	20.5	34.8	748609
UBP25	URP25	25	41	44	24.0	39.8	748617
UBP32	URP32	32	51	56	31.0	41.3	748625
UBP38	URP38	38	61	66	36.0	45.0	748633
UBP40	URP40	40	61	66	36.0	45.0	748641

Set consists of: Backing Plate, Retaining Plate and M8 x 20 Socket Head Cap Screw.

How to Order:

Qty. Catalog No.
12 UHM-16-63
12 748595