

Quality  
Ball Lock Punches  
Ball Lock Pilots  
Retainers

# BALL LOCK



Global leader in  
providing fabrication  
and stamping solutions

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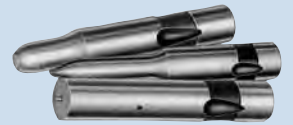
## PUNCHES HEAVY DUTY

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• BP_	Regular Punch	1.2
• BPT	Regular Pilot	1.3
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• BK_	Point Larger than Shank, Regular	1.8



## PUNCHES LIGHT DUTY

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• CPT	Regular Pilot	2.3
• CPA	Positive Pick-up Pilot	2.4
• CJB	Punch Blanks	2.5
• CPB	Punch Blanks	2.6
• CZ_	Point Larger than Shank, Jektol®	2.7
• CK_	Point Larger than Shank, Regular	2.8



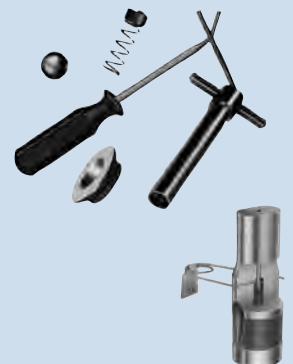
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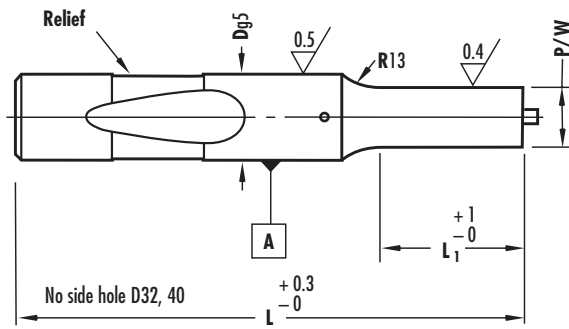
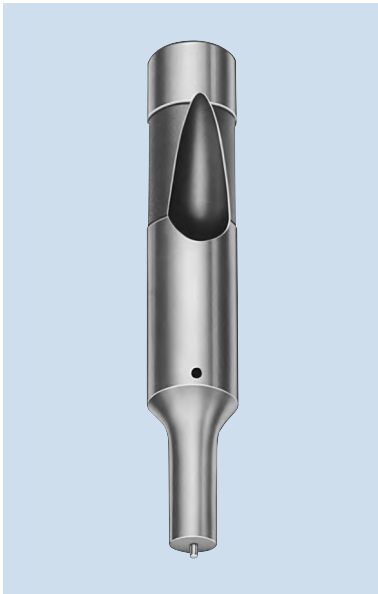
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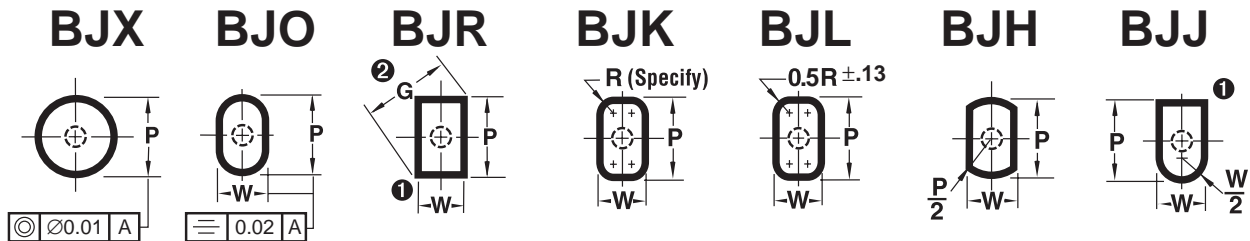
# JEKTOLE® PUNCHES HEAVY DUTY TYPE BJ\_

Steel	HRC
M2 (HSS)	60-63
PS	63-65



**Heavy Duty Jektol®**  
BJ and BP Punches conform to NAAMS™ standard for Ball Lock Punches.

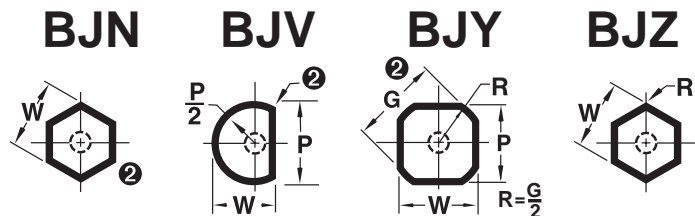
Steel: **M2 (Standard) and PS – please specify when ordering**



1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with die button 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 1.7.1

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



D	Point Length L <sub>1</sub>			Type & D	Range P	Type & D	Shape		L						Jektol® 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 L<sub>1</sub> = 10

• L<sub>1</sub> 25 not available

† J2 (P<3.0)  
(see page 5.1.1)

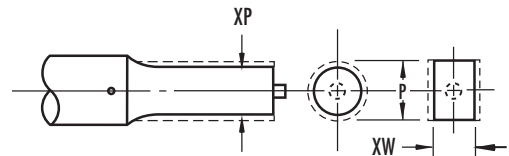
# Standard Alterations for BJ Jektol<sup>®</sup> Punches

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

L <sub>1</sub> 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

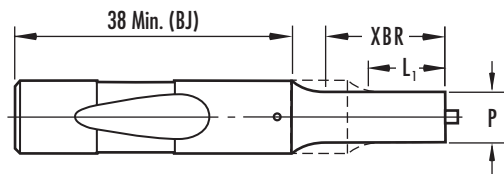
## XP, XW

P or W dimensions smaller than standard



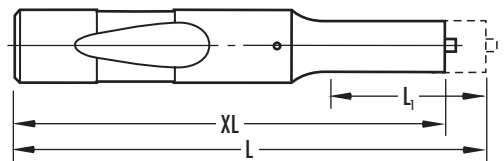
## XBR

Point Length longer than standard  
Specify XBR or XBB and length (see chart bottom)



## XL

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



## XN

DayTride<sup>®</sup> A unique wear resistant surface treatment.  
For M2 and PS only.

## XK

No Side Hole for air ejection. No cost.  
Jektol<sup>®</sup> Components not supplied.

## XNT

DAYTiN<sup>®</sup> Titanium Nitride coating for extra wear.  
Available for M2 and PS only.

## XJ

Smaller Jektol<sup>®</sup> Components  
See page 5.1.1

## XNM

An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2 and PS.

## XCN

TiCN<sup>®</sup> PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 and PS only.

### Standard Ball Seat Locations

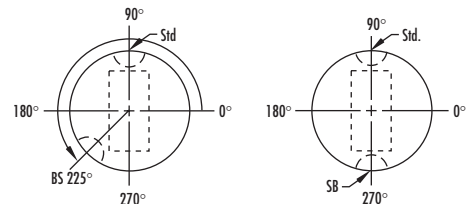
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180° or 270° can be specified at no additional cost.

### Custom Ball Seat Locations

Custom ball Seat Locations can be specified as BS and degree 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 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.



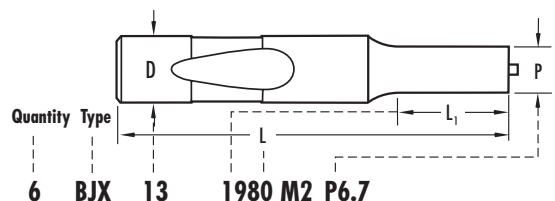
### BJL Punches For Longer Life

Dayton's BJL punches with a constant corner radius of 0.5R put 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.

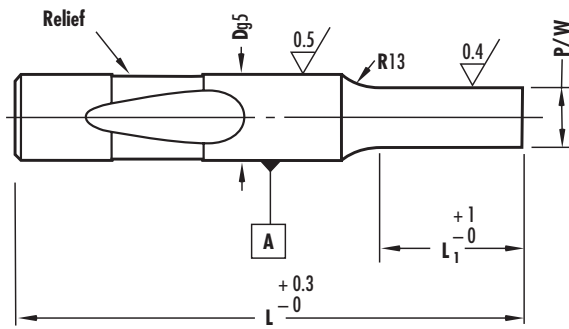
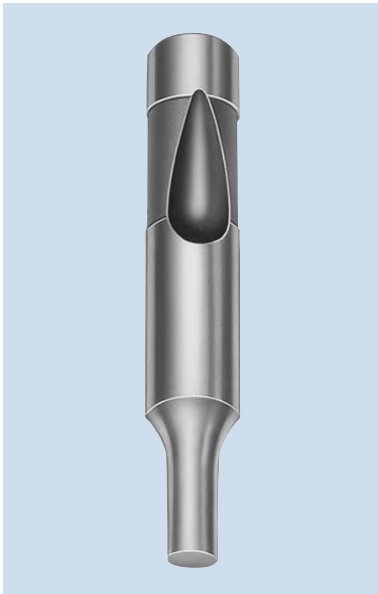
### How to Order:

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



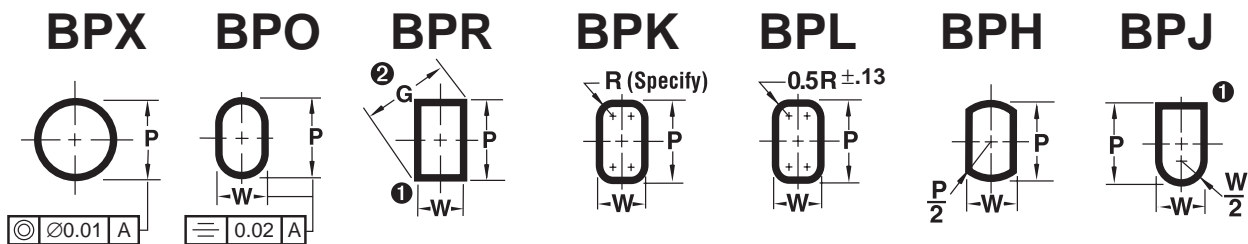
# REGULAR PUNCHES HEAVY DUTY TYPE BP\_

Steel	HRC
M2 (HSS)	60-63
PS	63-65



**Heavy Duty**  
BJ and BP Punches conform to NAAMS™ standard for Ball Lock Punches.

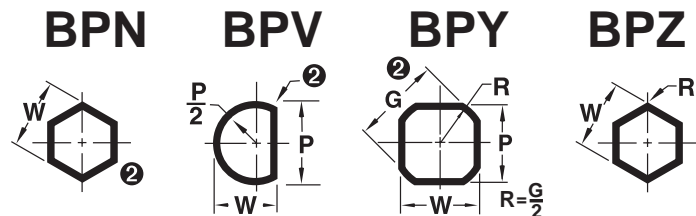
Steel: **M2 (Standard) and PS – please specify when ordering**



① Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with die button 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 1.8.1

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



D	Point Length L <sub>1</sub>			Type & D	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 L<sub>1</sub> = 10

• L<sub>1</sub> 25 not available

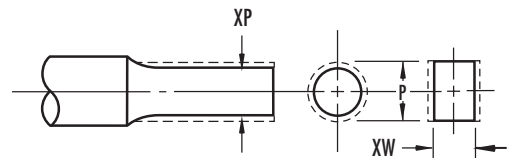
# Standard Alterations for BP Regular Punches

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

L <sub>1</sub> Max. ▶	XBR						XBB	XBR						XBB
	13	19	25	30	35	40	40	13	19	25	30	35	40	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	

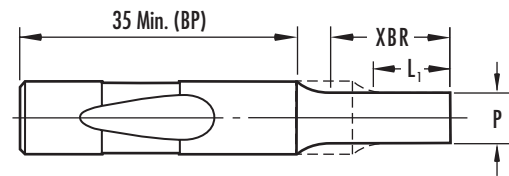
## XP, XW

P or W dimensions smaller than standard



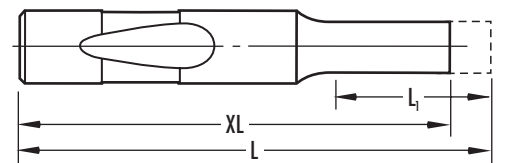
## XBR

Point Length longer than standard  
Specify XBR or XBB and length (see chart bottom)



## XL

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



## XN

DayTride® A unique wear resistant surface treatment.  
For M2 and PS only.

## XNT

DAYTIN® Titanium Nitride coating for extra wear.  
Available for M2 and PS only.

## XNM

An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2 and PS.

## XCN

TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 and PS only.

### Standard Ball Seat Locations

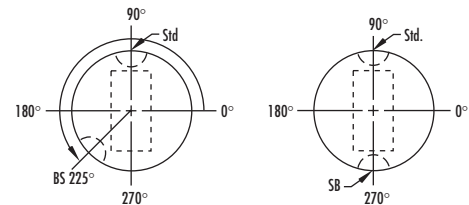
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180° or 270° can be specified at no additional cost.

### Custom Ball Seat Locations

Custom ball Seat Locations can be specified as BS and degree 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 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.



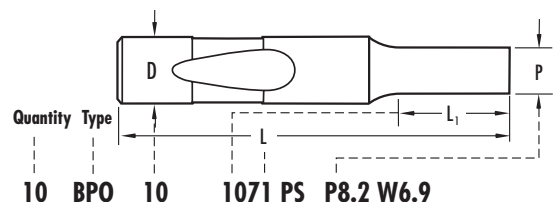
### BPL Punches For Longer Life

Dayton's BPL punches with a constant corner radius of 0.5R put 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.

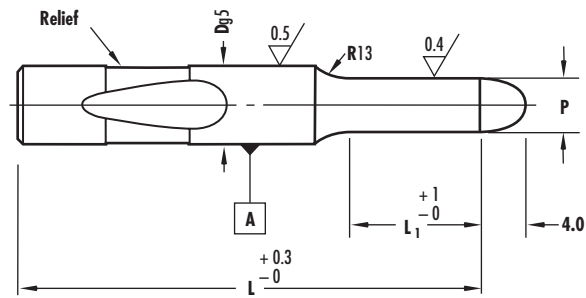
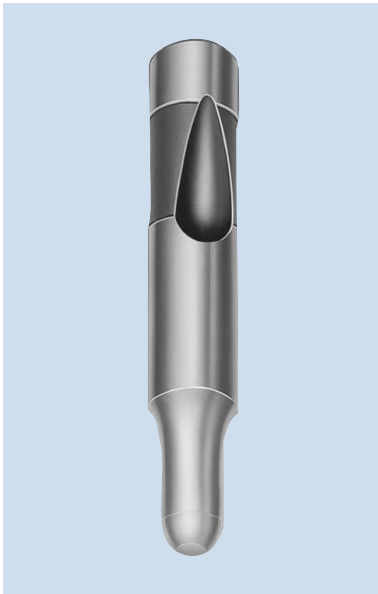
### How to Order:

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



# REGULAR PILOTS HEAVY DUTY TYPE BPT

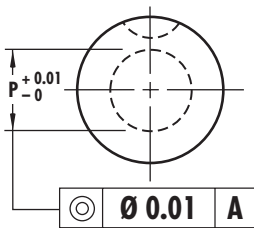
Steel	HRC
M2 (HSS)	60-63
PS	63-65



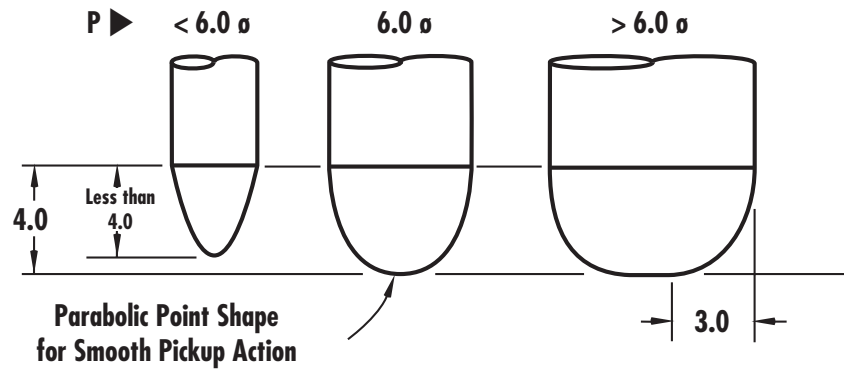
Heavy Duty

Steel: M2 (Standard) and PS – please specify when ordering

## BPT



When P = D Shank tolerance applies to full length



D	Point Length $L_1$			Type & D	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  $L_1 = 12$

■  $L_1$  27 not available



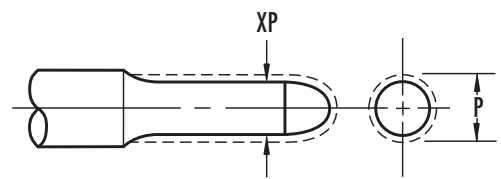
# Standard Alterations for BPT Regular Pilots

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

L <sub>1</sub> Max.	XBR					XBB
	15	21	27	32	37	42
D	Minimum P					
10	1.40	1.45	2.35	3.15	3.95	4.95
13	2.05	2.35	3.15	3.15	3.95	4.95
16	3.95	3.95	3.95	3.95	3.95	5.95
20	5.95	5.95	5.95	7.55	7.55	7.55
25	7.95	7.95	7.95	9.95	9.95	9.95
32	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

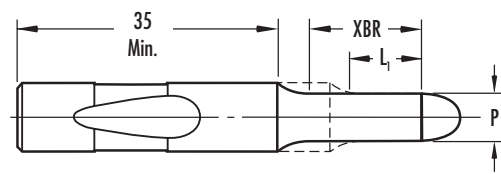
## XP

P dimension smaller than standard



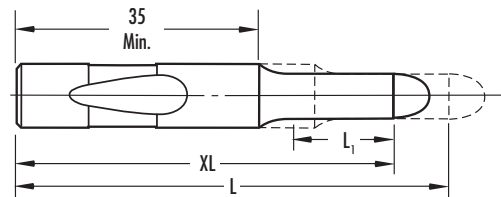
## XBR

Point Length longer than standard  
Specify XBR or XBB and length (see chart bottom)



## XL

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



## XN

DayTride® A unique wear resistant surface treatment.  
For M2 and PS only.

## XNT

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

## XNM

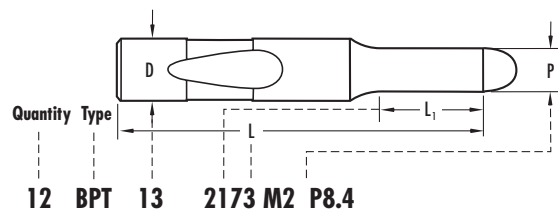
An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2 and PS.

## XCN

TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 and PS only.

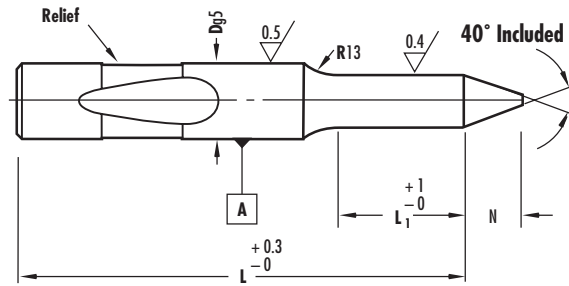
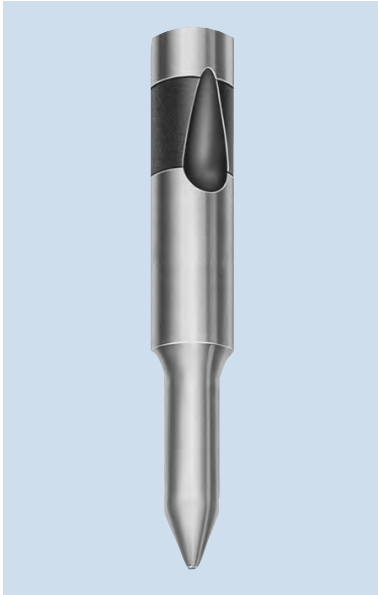
### How to Order:

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



# POSITIVE PICK-UP PILOTS HEAVY DUTY TYPE BPA

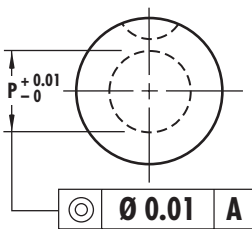
Steel	HRC
M2 (HSS)	60-63
PS	63-65



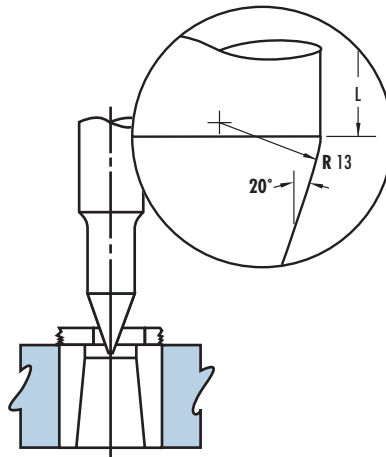
**Heavy Duty. All lengths between 80-150 mm available.**  
 BPA Pilots conform to NAAMST<sup>TM</sup> standard for Ball Lock Pilot Punches.

**Steel: M2 (Standard) and PS – please specify when ordering**

## 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 <sub>1</sub>			Type & D	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	31.00-40.00	40	•	•	•	•	•	•	•	•	

• L<sub>1</sub> max. 32  
 • L<sub>1</sub> max. 42

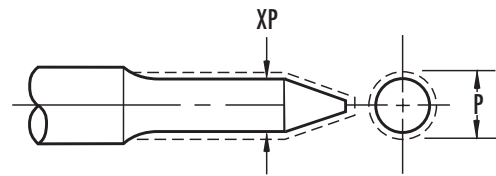
# Standard Alterations for BPA Positive Pick-up Pilots

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

L <sub>1</sub> Max.	XBR					XBB	X3B		
	13	19	25	30	35	40	50	60	70
D	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

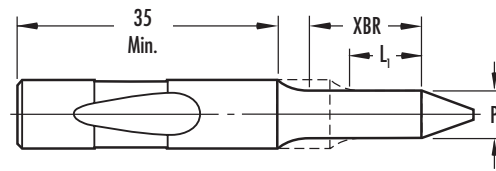
## XP

P dimension smaller than standard



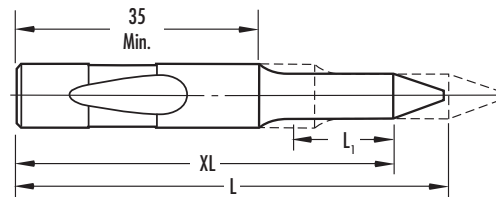
## XBR

Point Length longer than standard  
Specify XBR, XBB or X3B and length (see chart bottom)



## XL

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



## XN

DayTride® A unique wear resistant surface treatment.  
For M2 and PS only.

## XNT

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

## XNM

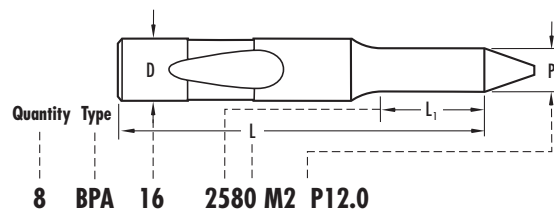
An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2 and PS.

## XCN

TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 and PS only.

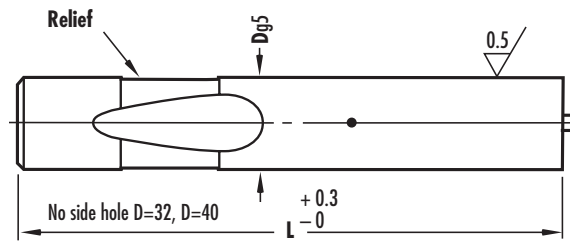
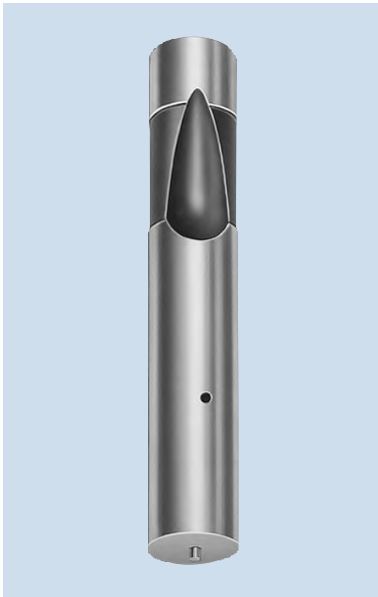
### How to Order:

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



# JEKTOLE® PUNCH BLANKS HEAVY DUTY TYPE BJB

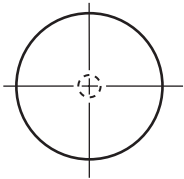
Steel	HRC
M2 (HSS)	60-63
PS	63-65



Heavy Duty Jektole®

Steel: M2 (Standard) and PS – please specify when ordering

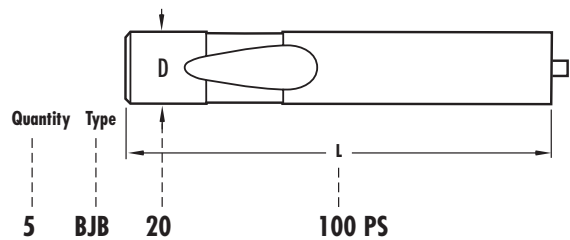
## BJB



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

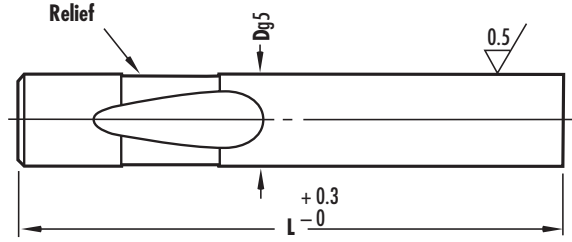
### How to Order:

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



# REGULAR PUNCH BLANKS HEAVY DUTY TYPE BPB

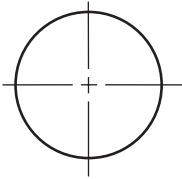
Steel	HRC
M2 (HSS)	60-63
PS	63-65



Heavy Duty Regular

Steel: M2 (Standard) and PS – please specify when ordering

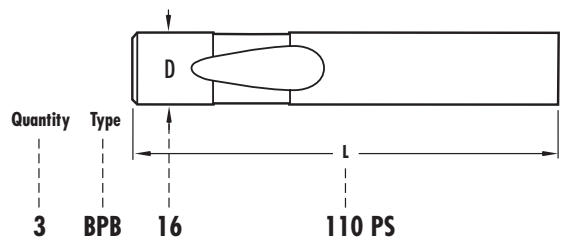
## BPB



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			•	•	•	•	•

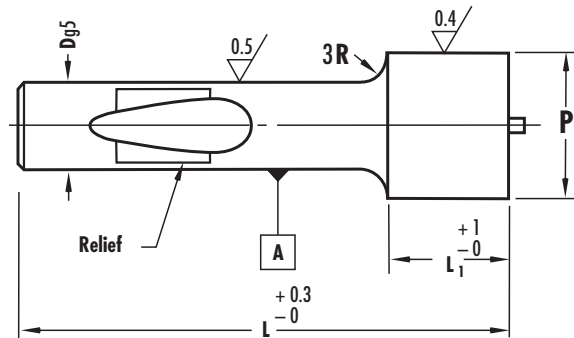
### How to Order:

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



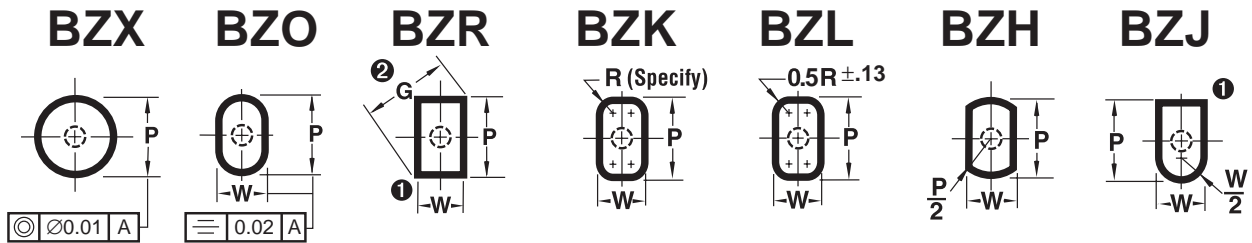
# POINT LARGER THAN SHANK PUNCHES HEAVY DUTY TYPE BZ\_ JEKTOLE®

Steel	HRC
M2 (HSS)	60-63



Point larger than shank, Heavy Duty, Jektol®  
 BZ Punches conform to NAAMS™ standard for Ball Lock Punches.

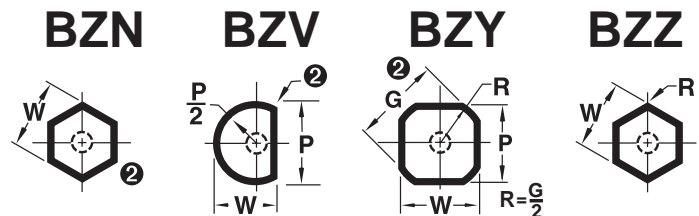
Steel: M2 (Standard) – please specify when ordering



1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with die button 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.

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

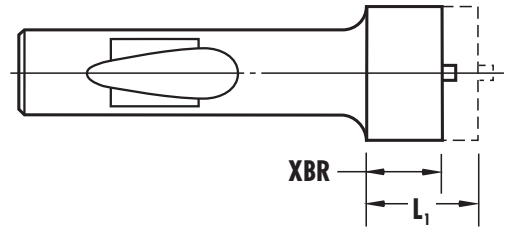


Point Length		Type & D	Range P	Type & D	Shape		L			Jektol® Pin
Std.	Alt.				Min. W	Max. P/G	80	90	100	
19	30	BZX13	13.10-32.00	BZ_13	5.00-32.00	•	•	•	J6	
19	30	BZX16	16.10-38.00	BZ_16	6.00-38.00	•	•	•	J6	
19	30	BZX20	20.10-40.00	BZ_20	8.00-40.00	•	•	•	J9	
19	30	BZX25	25.10-44.00	BZ_25	10.00-44.00	•	•	•	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	

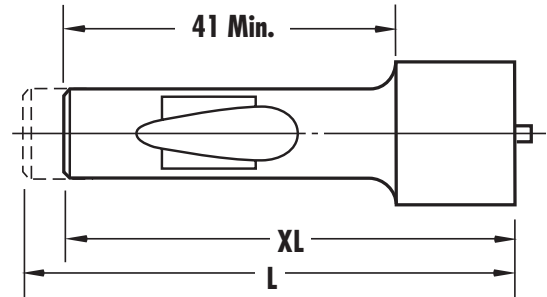
# Standard Alterations for BZ Point Larger than Shank Punches

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

**XBR** Point Length shorter than standard on point larger than shank punches.  
(Shortens punch from the point end.)



**XL** Overall Length  
Stock removal from shank end on Point Larger than Shank Punches.  
Does not alter ball seat location.



**XN** DayTride® A unique wear resistant surface treatment.  
For M2 only.

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

**XNM** An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2.

**XCN** TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 only.

## Standard Ball Seat Locations

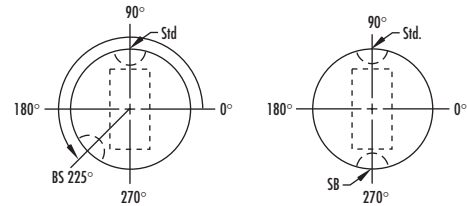
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180° or 270° can be specified at no additional cost.

## Custom Ball Seat Locations

Custom ball Seat Locations can be specified as BS and degree 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 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.



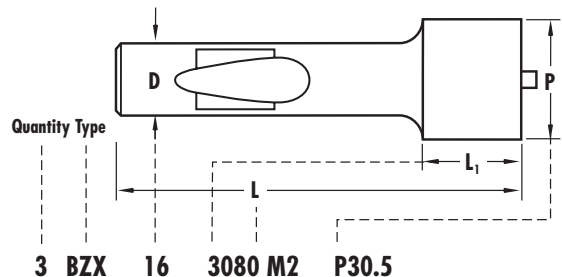
## BZL Punches For Longer Life

Dayton's BZL punches with a constant corner radius of 0.5R put 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.

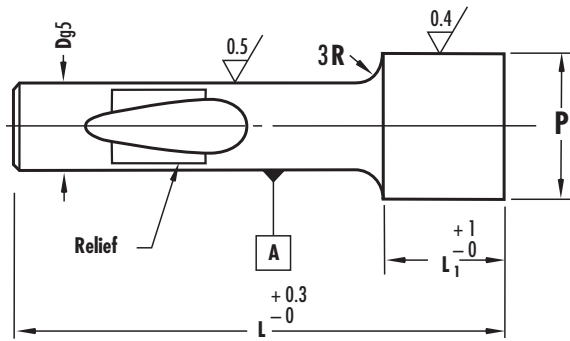
## How to Order:

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



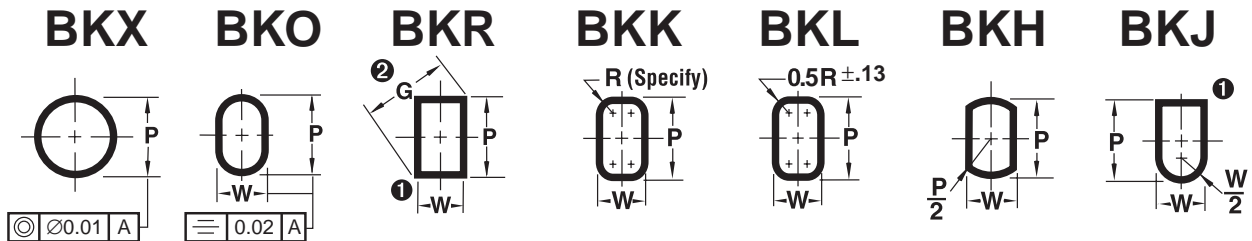
# POINT LARGER THAN SHANK PUNCHES HEAVY DUTY TYPE BK\_ REGULAR

Steel	HRC
M2 (HSS)	60-63



**Point larger than shank, Heavy Duty, Regular**  
BK Punches conform to NAAMST<sup>TM</sup> standard for Ball Lock Punches.

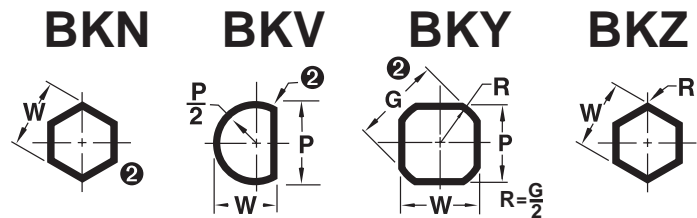
Steel: **M2 (Standard) – please specify when ordering**



1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with die button 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.

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



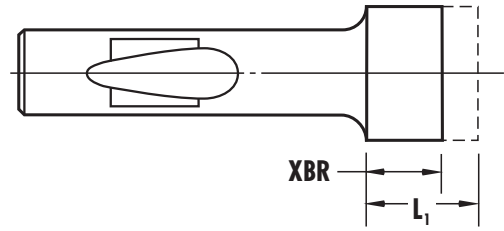
Point Length		Type & D	Range P	Type & D	Shape		L		
Std.	Alt.				Min. W	Max. P/G	80	90	100
19	30	BKX13	13.10-32.00	BK_13	5.00-32.00	•	•	•	
19	30	BKX16	16.10-38.00	BK_16	6.00-38.00	•	•	•	
19	30	BKX20	20.10-40.00	BK_20	8.00-40.00	•	•	•	
19	30	BKX25	25.10-44.00	BK_25	10.00-44.00	•	•	•	
19	30	BKX32	32.10-50.00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



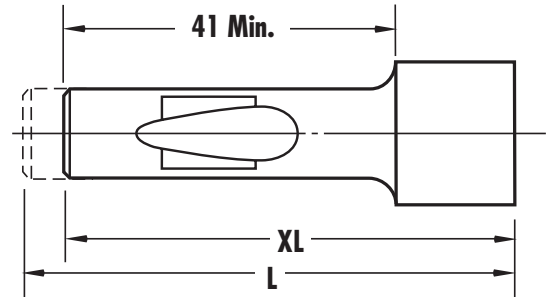
# Standard Alterations for BK Point Larger than Shank Punches

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

**XBR** Point Length shorter than standard on point larger than shank punches.  
(Shortens punch from the point end.)



**XL** Overall Length  
Stock removal from shank end on Point Larger than Shank Punches.  
Does not alter ball seat location.



**XN** DayTride® A unique wear resistant surface treatment.  
For M2 only.

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

**XNM** An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2.

**XCN** TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 only.

## Standard Ball Seat Locations

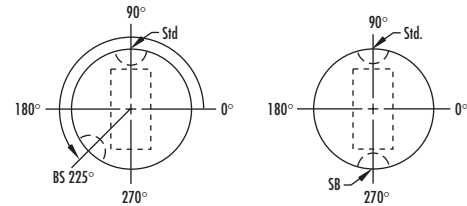
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180° or 270° can be specified at no additional cost.

## Custom Ball Seat Locations

Custom ball Seat Locations can be specified as BS and degree 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 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.



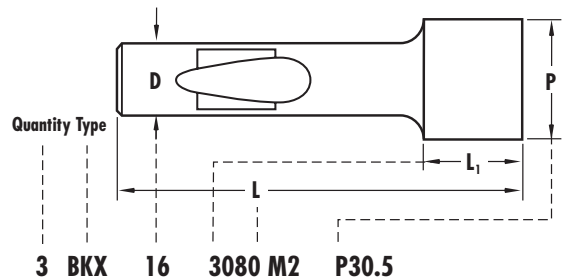
## BKL Punches For Longer Life

Dayton's BKL punches with a constant corner radius of 0.5R put 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.

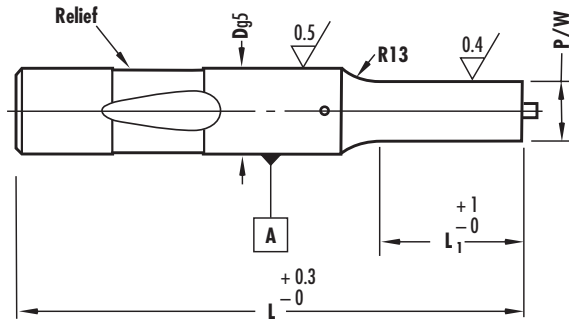
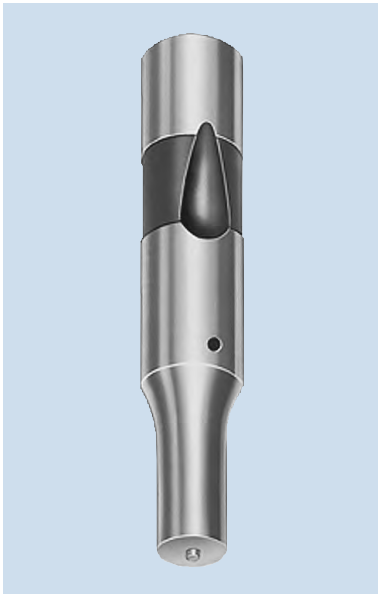
## How to Order:

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



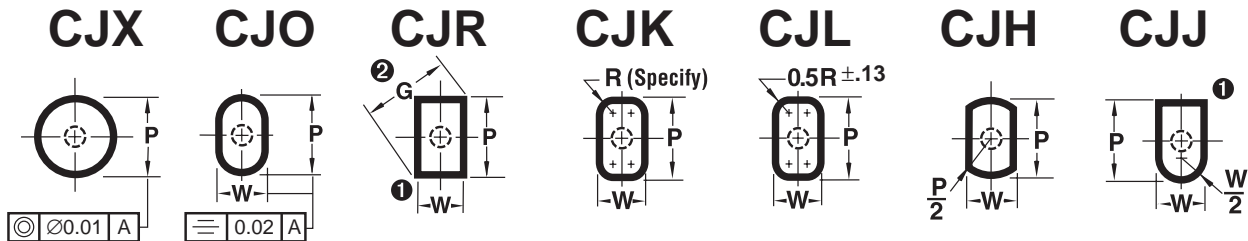
# JEKTOLE® PUNCHES LIGHT DUTY TYPE CJ\_

Steel	HRC
A2 (HWS)	60-63
M2 (HSS)	60-63
PS	63-65



Light Duty Jektole®-ISO 10071

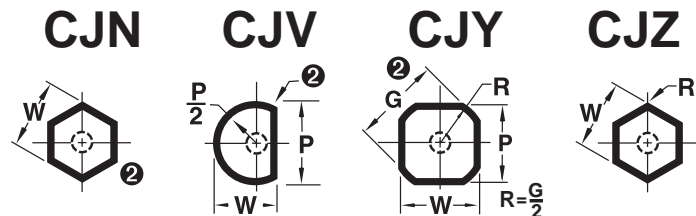
Steel: A2 (Standard), M2 and PS – please specify when ordering



1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with die button 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 2.7.1

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



D	Point Length L <sub>1</sub>			Type & D	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 L<sub>1</sub> = 10

\*\* J2 (P<2.0) †J2 (P<3.0) (see page 5.1.1)



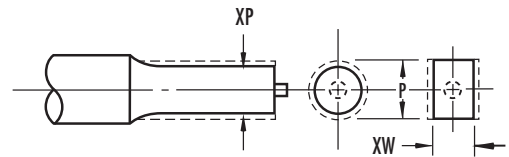
# Standard Alterations for CJ Punches

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

L <sub>1</sub> 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

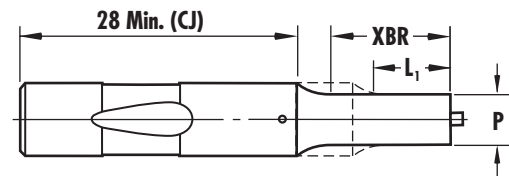
## XP, XW

P or W dimensions smaller than standard



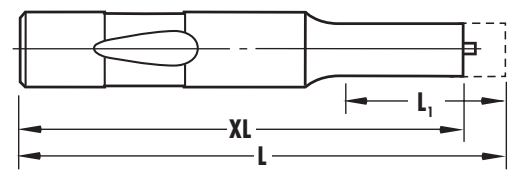
## XBR

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.



## XN

DayTribe® A unique wear resistant surface treatment for M2 and PS only.

## XK

No Side Hole for air ejection. No cost.  
Jektole® Components not supplied.

## XNT

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

## XJ

Smaller Jektole® Components  
See page 5.1.1

## XNM

An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2 and PS.

## XCN

TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 and PS only.

### Standard Ball Seat Locations

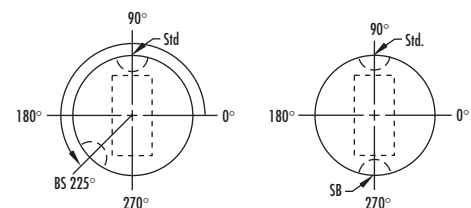
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180° or 270° can be specified at no additional cost.

### Custom Ball Seat Locations

Custom ball Seat Locations can be specified as BS and degree 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 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.



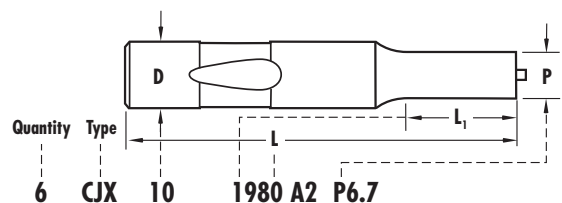
### CJL Punches For Longer Life

Dayton's CJL punches with a constant corner radius of 0.5R put 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.

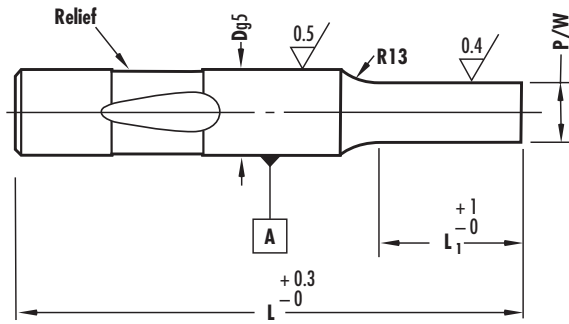
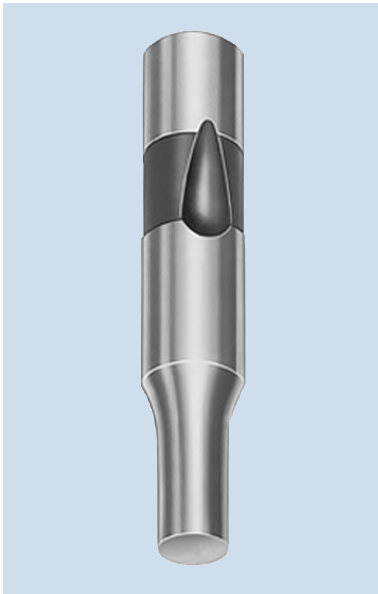
### How to Order:

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



# REGULAR PUNCHES LIGHT DUTY TYPE CP\_

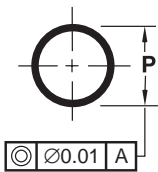
Steel	HRC
A2 (HWS)	60-63
M2 (HSS)	60-63
PS	63-65



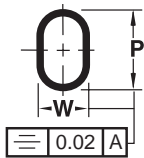
Light Duty Regular-ISO 10071

Steel: A2 (Standard), M2 and PS – please specify when ordering

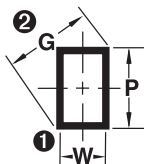
**CPX**



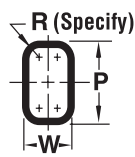
**CPO**



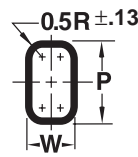
**CPR**



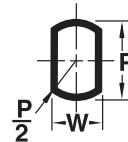
**CPK**



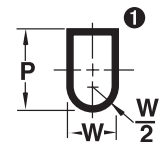
**CPL**



**CPH**



**CPJ**

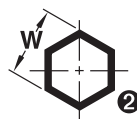


1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if the button is ordered with punch to eliminate interference with die button fillet when total clearance is 0.08 or less.

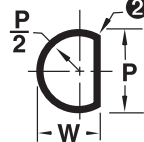
2 Check your P&W dimensions to be sure the diagonal G does not exceed the max. shown. If G exceeds the max, see page 2.8.1

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

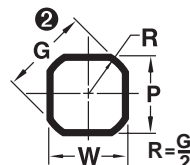
**CPN**



**CPV**



**CPY**



**CPZ**



D	Point Length L <sub>1</sub>			Type & D	Range P	Type & D	Shape		L				
	Std.	Alt.	Alt.				Min. W	Max. P/G	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 L<sub>1</sub> = 10

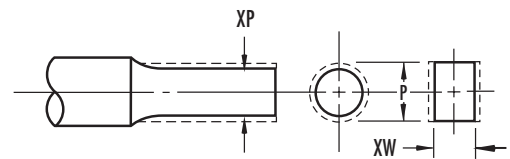


# Standard Alterations for CP Regular Punches

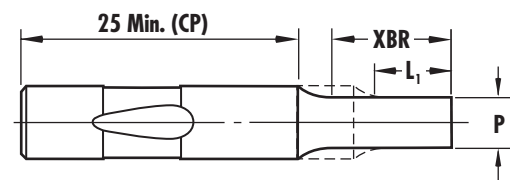
Standard alterations are the ranges beyond those sizes listed in the catalogue which can be manufactured for a slight additional charge.

L <sub>1</sub> 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

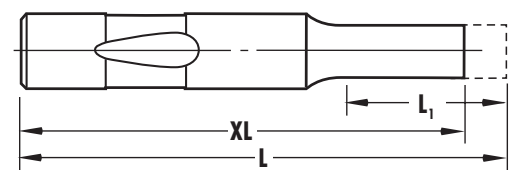
**XP, XW** P or W dimensions smaller than standard



**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.



**XN** DayTride® A unique wear resistant surface treatment for M2 and PS only.

**XNT** DAYTIN® Titanium Nitride coating for extra wear. Available for M2 and PS only.

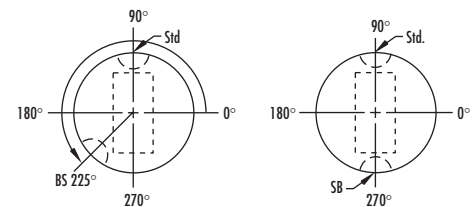
**XNM** An exclusive PVD solid lubricant coating. It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings. Available on M2 and PS.

**XCN** TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 and PS only.

**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 degree 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 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.



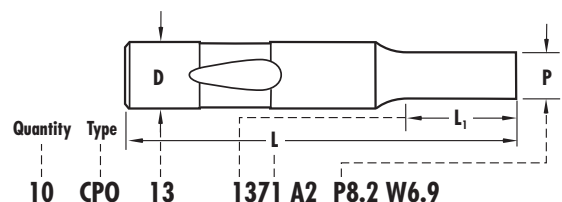
## CPL Punches For Longer Life

Dayton's CPL punches with a constant corner radius of 0.5R put 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.

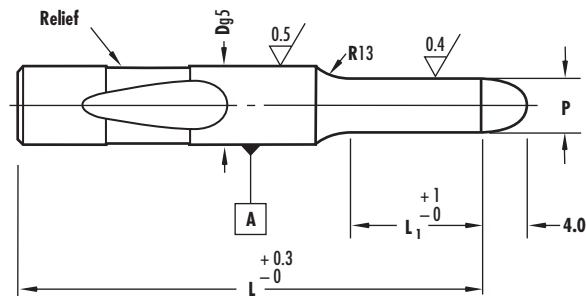
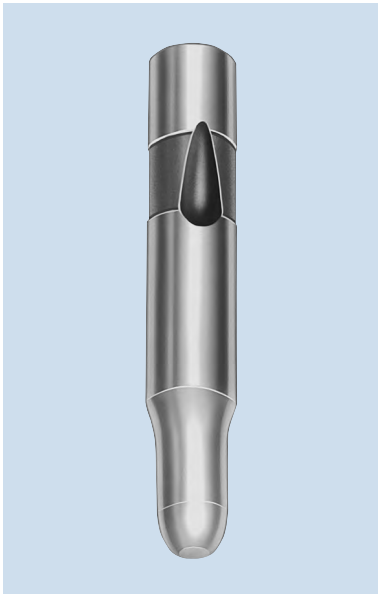
## How to Order:

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



# REGULAR PILOTS LIGHT DUTY TYPE CPT

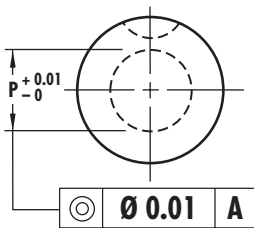
Steel	HRC
A2 (HWS)	60-63
M2 (HSS)	60-63
PS	63-65



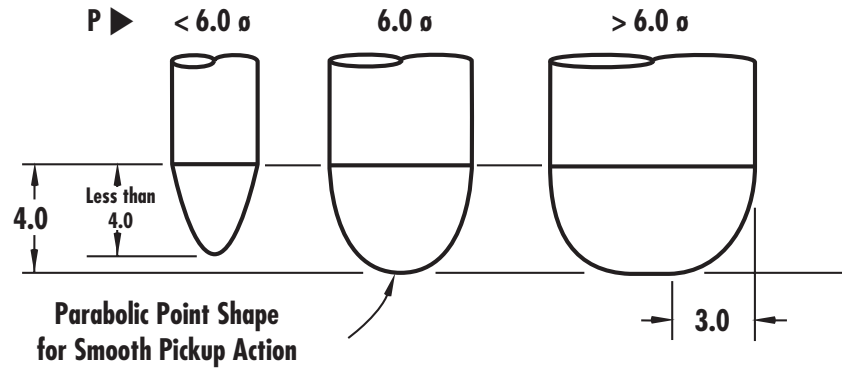
Light Duty Regular ISO 10071

Steel: A2 (Standard), M2 and PS – please specify when ordering

## CPT



When P = D Shank tolerance applies to full length



Parabolic Point Shape for Smooth Pickup Action

D	Point Length $L_1$			Type & D	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  $L_1 = 12$

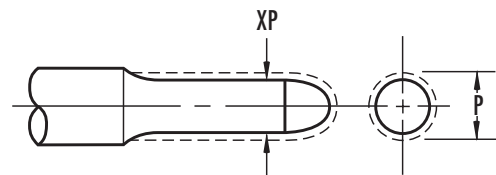
# Standard Alterations for CPT Regular Pilots

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

L <sub>1</sub> Max.	XBR					XBB
	15	21	27	32	37	42
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
13	2.05	2.35	3.15	3.15	3.95	4.95
16	3.95	3.95	3.95	3.95	3.95	5.95
20	5.95	5.95	5.95	7.55	7.55	7.55
25	7.95	7.95	7.95	9.95	9.95	9.95
32	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

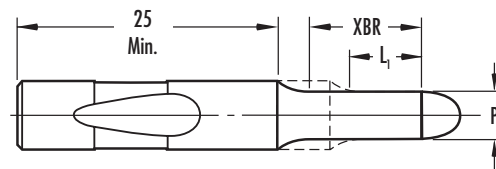
## XP

P dimension smaller than standard



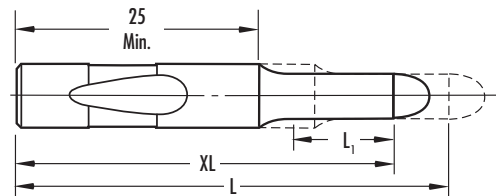
## XBR

Point Length longer than standard  
Specify XBR, or XBB and length (see chart at left)



## XL

Overall Length shortened  
Stock removal from point end.  
Standard or Alternate L<sub>1</sub> length is maintained on CPA only.



## XN

DayTride® A unique wear resistant surface treatment.  
For M2 and PS only.

## XNT

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

## XNM

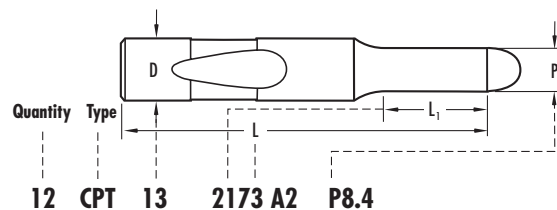
An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2 and PS.

## XCN

TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 and PS only.

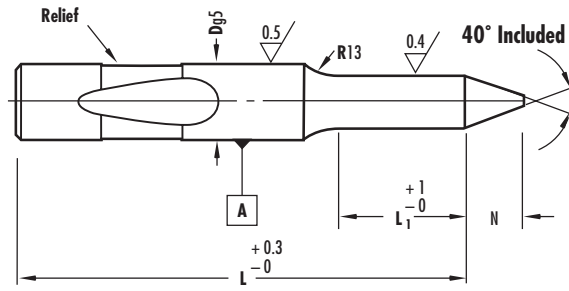
### How to order:

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



# POSITIVE PICK-UP PILOTS LIGHT DUTY TYPE CPA

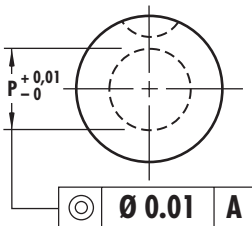
Steel	HRC
M2 (HSS)	60-63



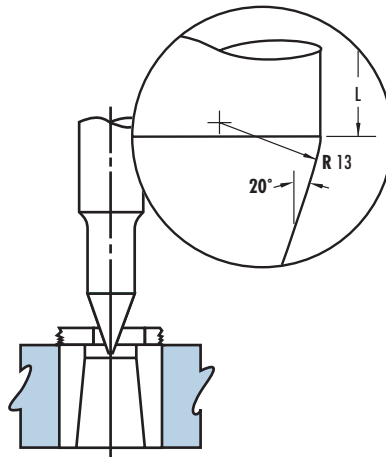
Light Duty. All lengths between 71-150 mm available.

Steel: M2 (Standard) – please specify when ordering

## 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 <sub>1</sub>			Type & D	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		•	•	•	•	•	•	•	•

• L<sub>1</sub> max. 33  
 • L<sub>1</sub> max. 42



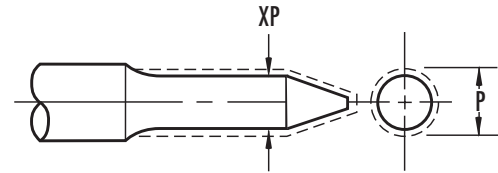
# Standard Alterations for CPA Positive Pick-up Pilots

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

L <sub>1</sub> Max.	XBR				XBB	X3B			
	13	19	25	30	35	40	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

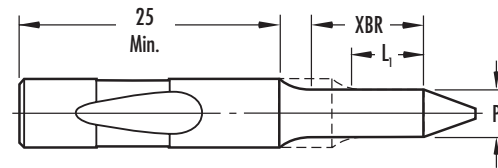
## XP

P dimensions smaller than standard



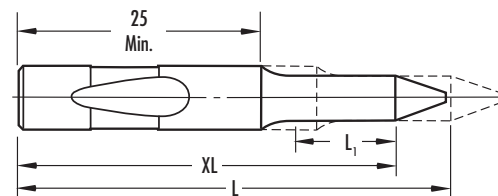
## XBR

Point Length longer than standard  
Specify XBR, XBB, or X3B and length (see chart at left)



## XL

Overall Length shortened  
Stock removal from point end.  
Standard or Alternate L<sub>1</sub> 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.

## XNM

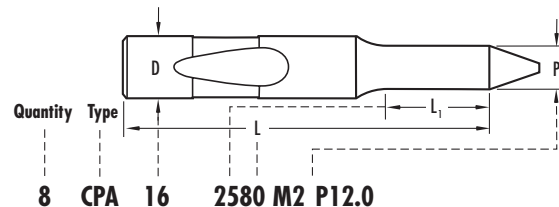
An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2.

## XCN

TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 only.

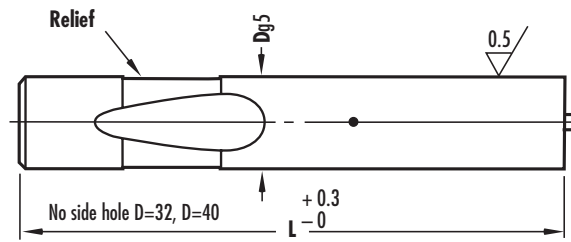
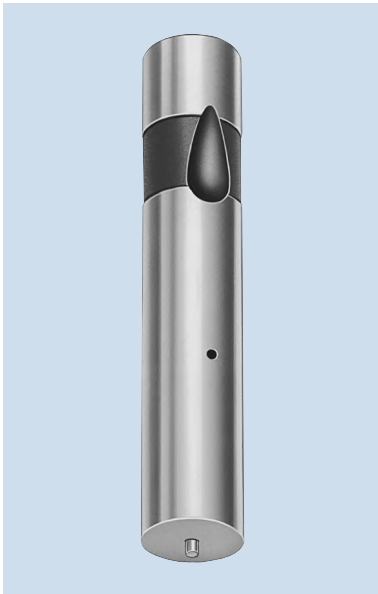
### How to order:

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



# JEKTOLE® PUNCH BLANKS LIGHT DUTY TYPE CJB

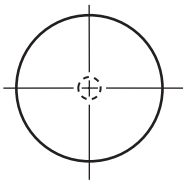
Steel	HRC
A2 (HWS)	60-63
M2 (HSS)	60-63
PS	63-65



Light Duty Jektole® ISO 10071, CJB

Steel: A2 (Standard), M2 and PS – please specify when ordering

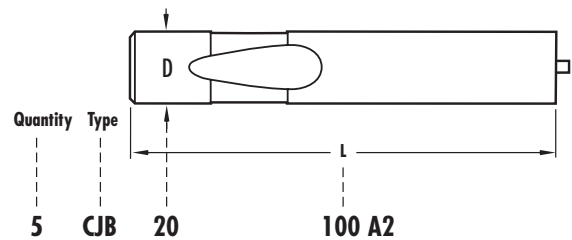
## CJB



D	Type & D	L					Jektole® 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

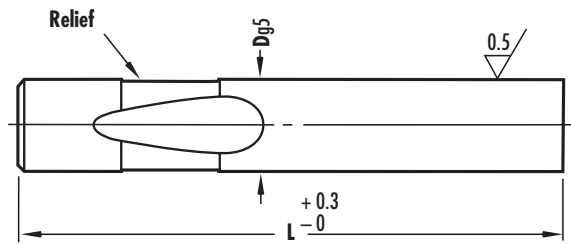
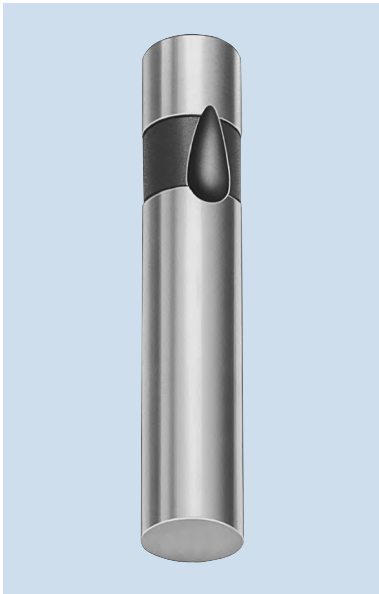
### How to order:

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



# REGULAR PUNCH BLANKS LIGHT DUTY TYPE CPB

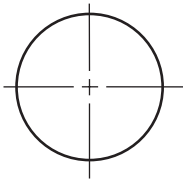
Steel	HRC
A2 (HWS)	60-63
M2 (HSS)	60-63
PS	63-65



Light Duty Regular ISO 10071

Steel: A2 (Standard), M2 and PS – please specify when ordering

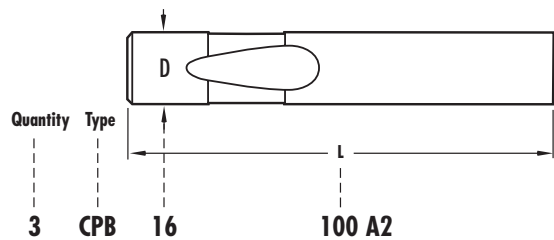
## CPB



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			•	•	•

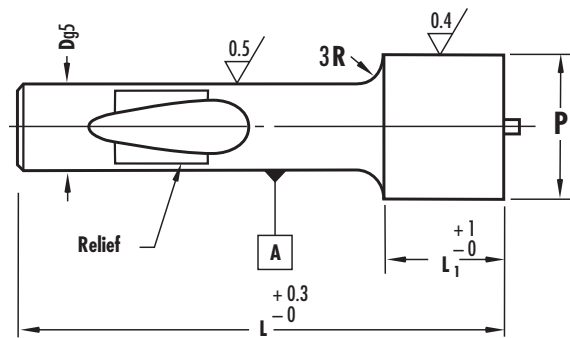
### How to order:

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



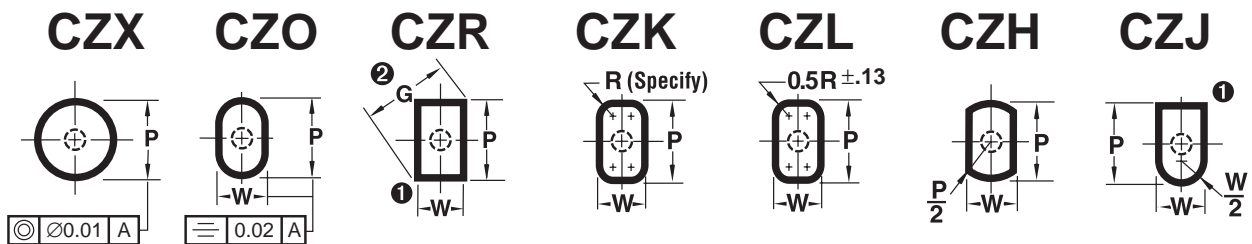
# POINT LARGER THAN SHANK PUNCHES LIGHT DUTY TYPE CZ\_ JEKTOLE®

Steel	HRC
A2 (HWS)	60-63
M2 (HSS)	60-63



Point larger than shank, Light Duty, Jektrole®

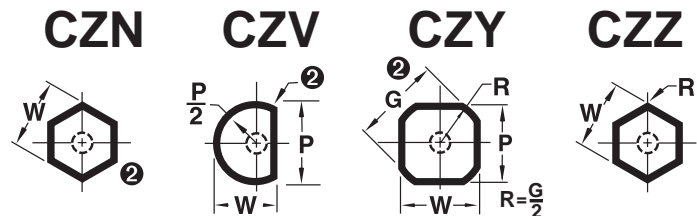
Steel: A2 (Standard), M2 – please specify when ordering



1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with die button 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.

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

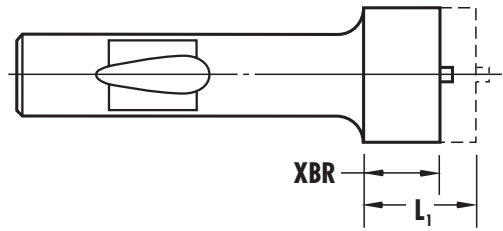


Point Length		Type & D	Range P	Type & D	Shape		L			Jektrole® Pin
Std.	Alt.				Min. W	Max. P/G	80	90	100	
19	30	CZX13	13.10-32.00	CZ_13	5.00-32.00	•	•	•	J6	
19	30	CZX16	16.10-38.00	CZ_16	6.00-38.00	•	•	•	J6	
19	30	CZX20	20.10-40.00	CZ_20	8.00-40.00	•	•	•	J9	
19	30	CZX25	25.10-44.00	CZ_25	10.00-44.00	•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

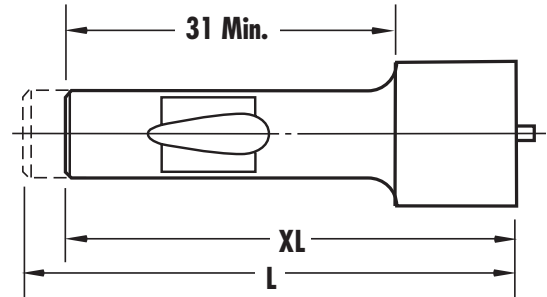
# Standard Alterations for CZ Point Larger than Shank Punches

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

**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.



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

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

**XNM** An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2.

**XCN** TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 only.

## Standard Ball Seat Locations

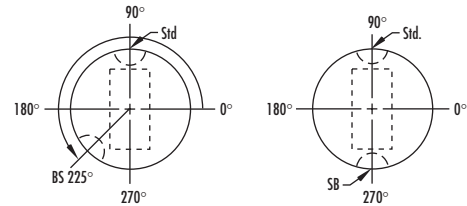
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180° or 270° can be specified at no additional cost.

## Custom Ball Seat Locations

Custom ball Seat Locations can be specified as BS and degree 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 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.



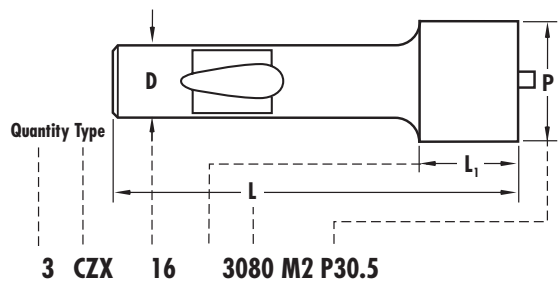
## CZL Punches For Longer Life

Dayton's CZL punches with a constant corner radius of 0.5R put 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.

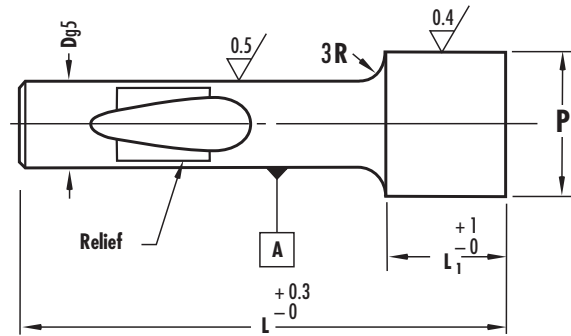
## How to order:

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



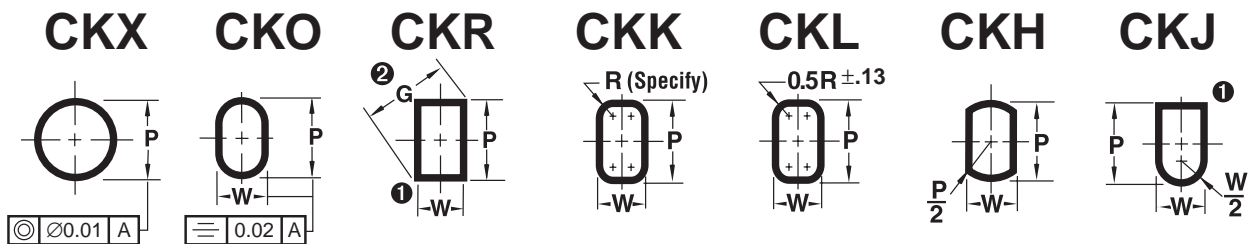
# POINT LARGER THAN SHANK PUNCHES LIGHT DUTY TYPE CK\_REGULAR

Steel	HRC
A2 (HWS)	60-63
M2 (HSS)	60-63



Point larger than shank, Light Duty, Regular

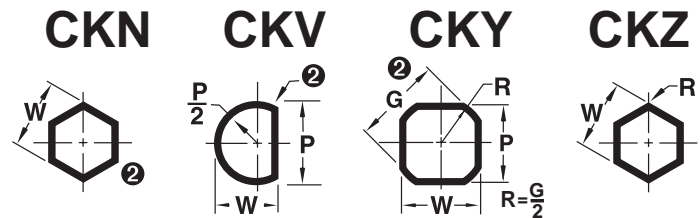
Steel: A2 (Standard), M2 – please specify when ordering



1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with die button 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.

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

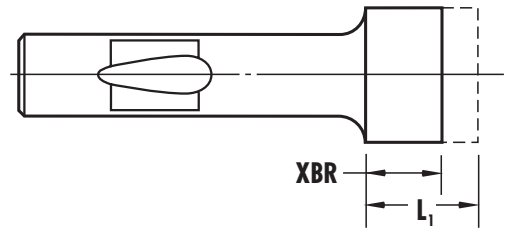


Point Length		Type & D	Range P	Type & D	Shape		L		
Std.	Alt.				Min. W	Max. P/G	80	90	100
19	30	CKX13	13.10-32.00	CK_13	5.00-32.00	•	•	•	
19	30	CKX16	16.10-38.00	CK_16	6.00-38.00	•	•	•	
19	30	CKX20	20.10-40.00	CK_20	8.00-40.00	•	•	•	
19	30	CKX25	25.10-44.00	CK_25	10.00-44.00	•	•	•	
19	30	CKX32	32.10-50.00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

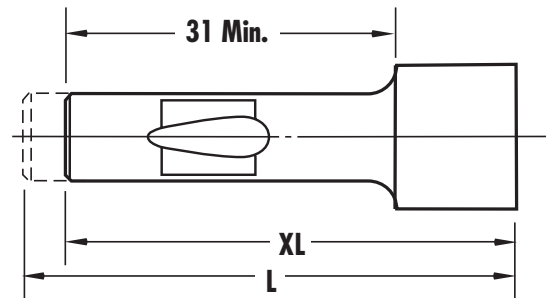
# Standard Alterations for CK Point Larger than Shank Punches

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

**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.



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

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

**XNM** An exclusive PVD solid lubricant coating.  
It provides a combination of lubricity and wear resistance not available from other PVD or CVD techniques. Produces a coefficient of friction lower than other coatings.  
Available on M2.

**XCN** TiCN® PVD coating provides ultra hardness (harder than carbide) and superior abrasive wear resistance. For M2 only.

## Standard Ball Seat Locations

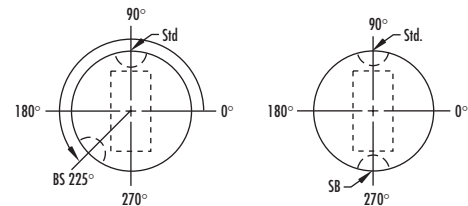
Standard Ball Seat Location is at 90°. Alternate locations of 0°, 180° or 270° can be specified at no additional cost.

## Custom Ball Seat Locations

Custom ball Seat Locations can be specified as BS and degree 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 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.



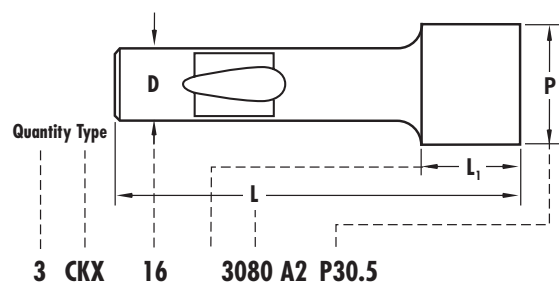
## CKL Punches For Longer Life

Dayton's CKL punches with a constant corner radius of 0.5R put 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  
Steel  
P or P&W Dimensions  
Standard Alterations

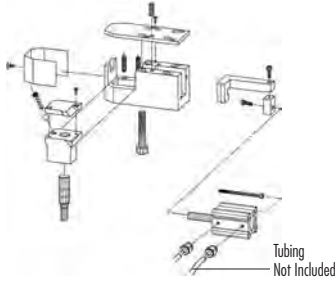


# HEAVY DUTY CHANGE RETAINERS BRA



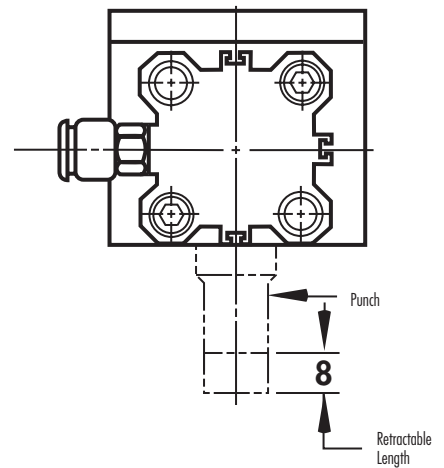
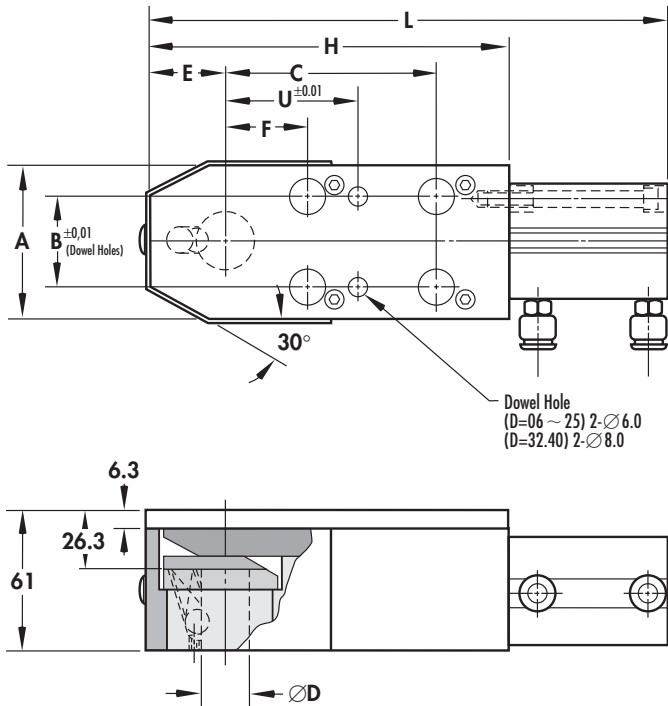
Change Retainers are used where different hole patterns are required. Various hole patterns can be accomplished without the need for multiple dies. Different parts, such as right and left hand can be run in one die.

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.



Change Retainers includes all necessary screws and dowels, air cylinder and fittings. The fittings supplied are for 6mm tubing and 1/4 tubing. The metric fittings are blue and the inch fittings are orange. Tubing is not included.

With pneumatic control, Heavy Duty



Air cylinder can be removed and remounted 90° or 180° from location shown

Recommended air pressure is: 450-520 kP/cm2 (65-75 PSI)  
 Min. pressure: 315 kP/cm2 (45 PSI)  
 Max. pressure: 1000 kP/cm2 (145 PSI)

Note orientation of ball when ordering shape punches

Catalog Number		D	L	A	B	C	E	F	H	U	Screw Size
Heavy Duty	Code										
BRA	10	10.0	172.0	46	30	—	32	21	114	37	M8
BRA	13	13.0	183.0	50	30	—	34	25	120	41	M10
BRA	16	16.0	204.0	58	38	—	37	29	136	45	M10
BRA	20	20.0	257.0	80	56	100	44	38	174	60	M12
BRA	25	25.0									
BRA	32	32.0									
BRA	40	40.0									

## How to order:

Specify: Quantity  
 Catalog No.

**6**  
**BRA20**



# RETAINERS <sup>-TRUE-</sup><sub>-POSITION-</sub> HEAVY DUTY TYPE BRT

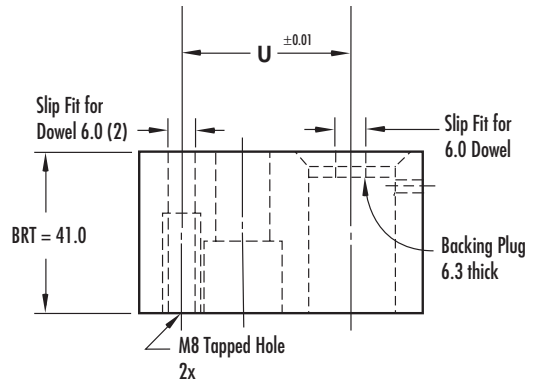
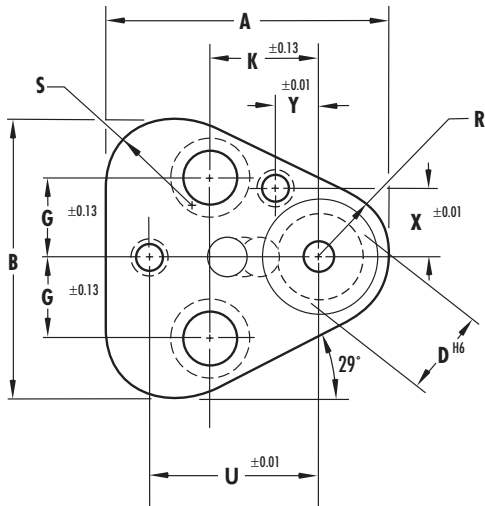


- The in-line dowel guarantees precise punch-to-die button alignment. You gain higher quality parts, longer punch life and drastically reduced downtime.
- True-Position retainers eliminate hand fitting and cut mounting time by nearly 50%. Simply pull the retainer from its box and screw it to the die 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

Heavy Duty  
BRT conforms to NAAMS™ standard for Ball Lock Punch Retainer.



**How to order:**

Specify: Quantity **10**  
Catalog No. **BRT10**

Catalog Number		D	A	B	G	K	R	S	U	X	Y	Screw Size
Heavy Duty	Code											
	BRT 10	10.0	44.5	43.7	11.1	19.0	9.5	12.0	26.925	9.0	7.5	M8
	BRT 13	13.0	50.8	50.0	14.3	19.0	12.7	15.2	29.970	12.0	6.5	M8
	BRT 16	16.0	54.0	53.2	15.9	19.0	14.3	16.8	31.750	13.5	6.0	M8
	BRT 20	20.0	60.3	59.5	17.5	19.0	17.5	20.0	33.530	16.5	5.0	M10
	BRT 25	25.0	69.9	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
	BRT 32	32.0	69.1	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
	BRT 40	40.0	77.4	76.6	24.0	27.0	26.0	28.5	43.993	26.0	10.0	M12

# RETAINERS <sup>-TRUE-</sup><sub>-POSITION-</sub> HEAVY DUTY TYPE BRTBS

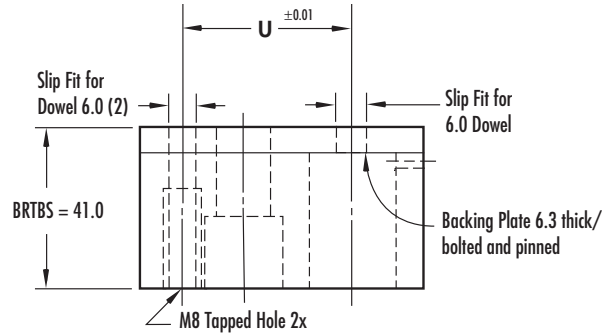
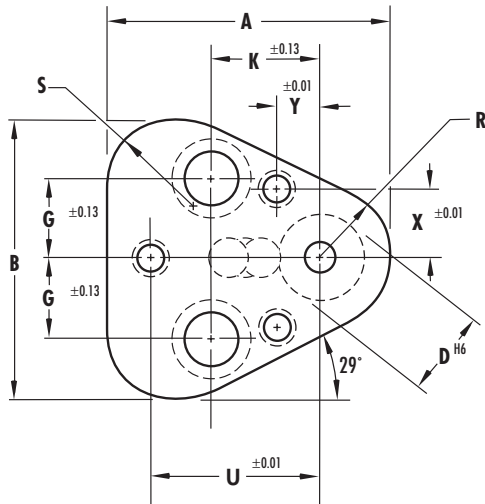


- The in-line dowel guarantees precise punch-to-die button alignment. You gain higher quality parts, longer punch life and drastically reduced downtime.
- True-Position retainers eliminate hand fitting and cut mounting time by nearly 50%. Simply pull the retainer from its box and screw it to the die 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

Heavy Duty  
BRTBS conforms to NAAMS™ standard for Ball Lock Punch Retainer.



**How to order:**

Specify: Quantity

Catalog No.

**10  
BRTBS10**

Catalog Number		D	A	B	G	K	R	S	U	X	Y	Screw Size
Heavy Duty	Code											
BRTBS	10	10.0	44.5	43.7	11.1	19.0	9.5	12.0	26.925	9.0	7.5	M8
BRTBS	13	13.0	50.8	50.0	14.3	19.0	12.7	15.2	29.970	12.0	6.5	M8
BRTBS	16	16.0	54.0	53.2	15.9	19.0	14.3	16.8	31.750	13.5	6.0	M8
BRTBS	20	20.0	60.3	59.5	17.5	19.0	17.5	20.0	33.530	16.5	5.0	M10
BRTBS	25	25.0	69.9	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
BRTBS	32	32.0	69.1	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
BRTBS	40	40.0	77.4	76.6	24.0	27.0	26.0	28.5	43.993	26.0	10.0	M12



# RETAINERS <sup>TRUE POSITION</sup> LIGHT DUTY TYPE CRT

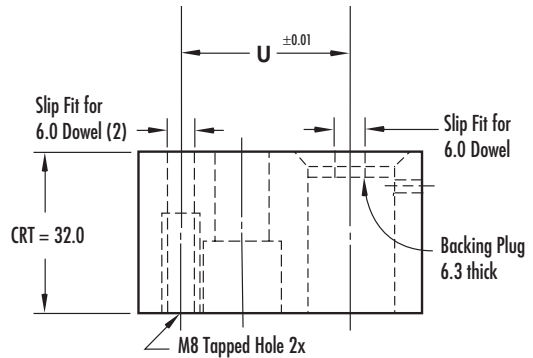
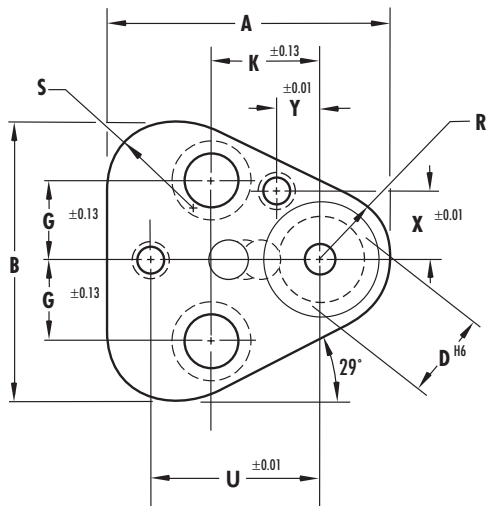


- The in-line dowel guarantees precise punch-to-die button alignment. You gain higher quality parts, longer punch life and drastically reduced downtime.
- True-Position retainers eliminate hand fitting and cut mounting time by nearly 50%. Simply pull the retainer from its box and screw it to the die 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

Light Duty

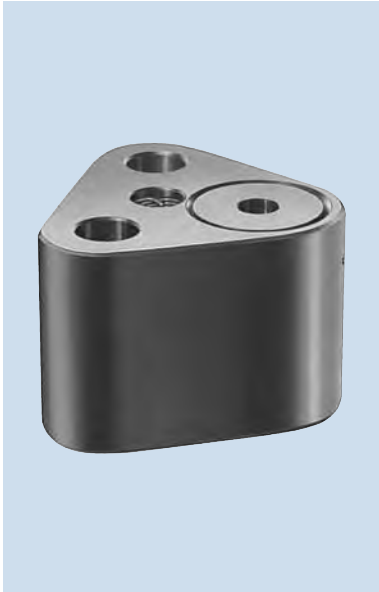


### How to order:

Specify: Quantity **13**  
Catalog No. **CRT25**

Catalog Number		D	A	B	G	K	R	S	U	X	Y	Screw Size
Light Duty	Code											
CRT	10	10.0	44.5	43.7	11.1	19.0	9.5	12.0	26.925	9.0	7.5	M8
CRT	13	13.0	50.8	50.0	14.3	19.0	12.7	15.2	29.970	12.0	6.5	M8
CRT	16	16.0	54.0	53.2	15.9	19.0	14.3	16.8	31.750	13.5	6.0	M8
CRT	20	20.0	60.3	59.5	17.5	19.0	17.5	20.0	33.530	16.5	5.0	M10
CRT	25	25.0	69.9	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
CRT	32	32.0	69.1	69.1	19.8	23.8	22.2	24.7	40.640	22.0	7.0	M12
CRT	38	38.0	77.4	76.6	24.0	27.0	26.0	28.5	43.993	26.0	10.0	M12

# ULTRA-COMPACT RETAINERS HEAVY DUTY TYPE NRT



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.

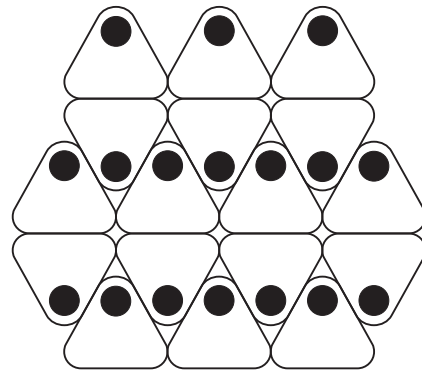
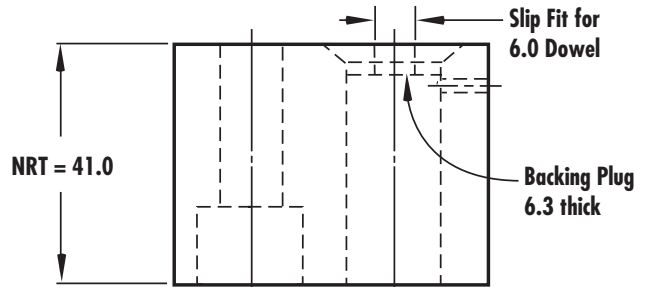
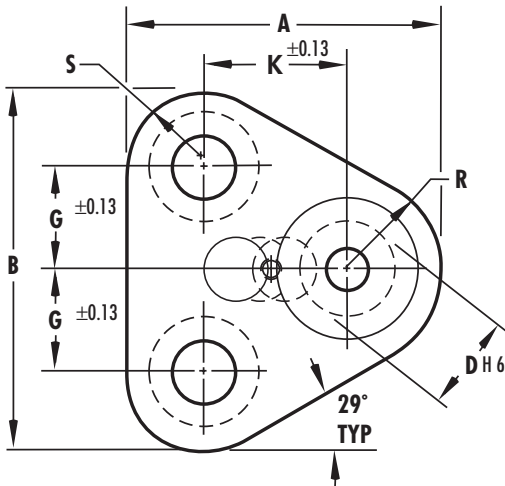
Also interchangeable with the True Position Retainer

**ULTRA COMPACT Retainer includes:**

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

NRT Heavy Duty

**The smallest standardized retaining plate in the industry.**



Fit more holes into tight spaces

**How to order:**

Specify: Quantity  
Catalog No.

**23**  
**NRT10**

Catalog Number		D	A	B	G	K	R	S	Screw Size
Heavy Duty	Code								
NRT	10	10.00	38.5	40.6	11.1	19.0	9.5	9.5	M8
NRT	13	13.00	41.7	47.9	14.3	19.0	12.7	9.5	M8
NRT	16	16.00	43.3	51.6	15.9	19.0	14.3	9.5	M8
NRT	20	20.00	47.5	57.9	17.5	19.0	17.5	11.0	M10
NRT	25	25.00	59.2	68.8	19.8	23.8	22.2	16.5	M12
NRT	32	32.00	59.2	68.8	19.8	23.8	22.2	26.5	M12
NRT	40	40.00	69.0	76.5	24.0	27.0	26.0	22.0	M12



# ULTRA-COMPACT RETAINERS LIGHT DUTY TYPE TRT



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.

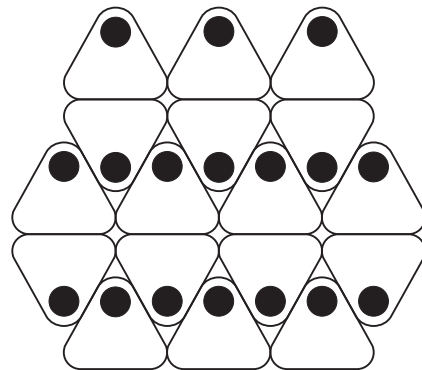
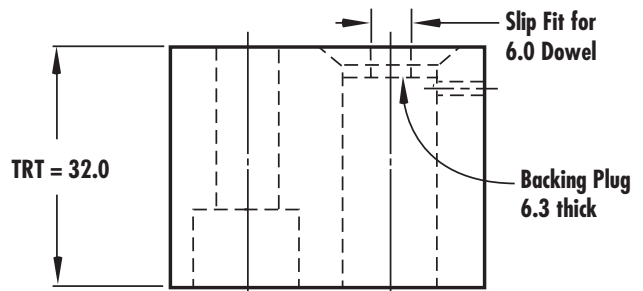
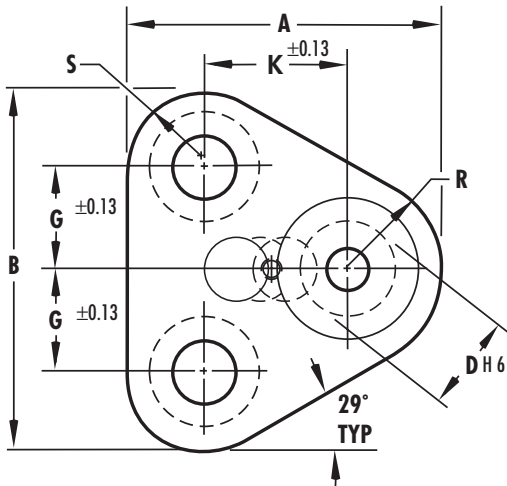
Also interchangeable with the True Position Retainer

**ULTRA COMPACT Retainer includes:**

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

TRT Light Duty

**The smallest standardized retaining plate in the industry.**



Fit more holes into tight spaces

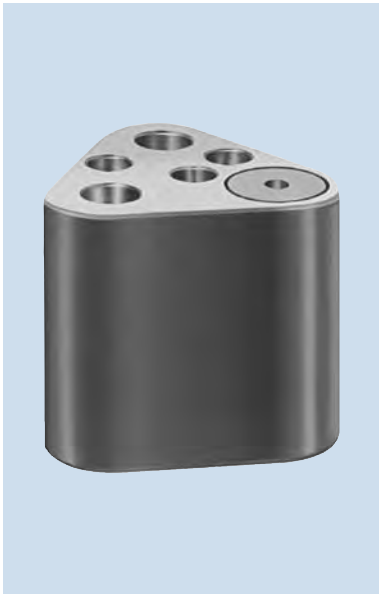
**How to order:**

Specify: Quantity  
Catalog No.

15  
**TRT25**

Catalog Number		D	A	B	G	K	R	S	Screw Size
Light Duty	Code								
NRT	10	10.00	38.5	40.6	11.1	19.0	9.5	9.5	M8
NRT	13	13.00	41.7	47.9	14.3	19.0	12.7	9.5	M8
NRT	16	16.00	43.3	51.6	15.9	19.0	14.3	9.5	M8
NRT	20	20.00	47.5	57.9	17.5	19.0	17.5	11.0	M10
NRT	25	25.00	59.2	68.8	19.8	23.8	22.2	16.5	M12
NRT	32	32.00	59.2	68.8	19.8	23.8	22.2	26.5	M12

# RETAINER LIGHT DUTY TYPE TRN06



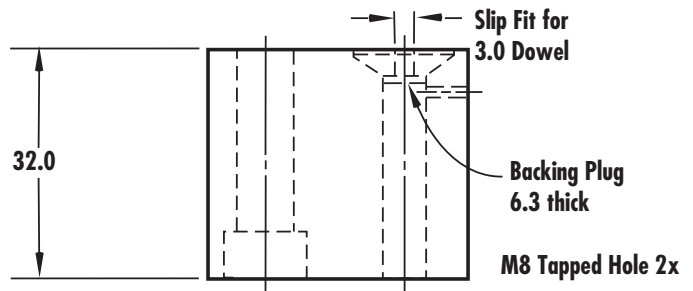
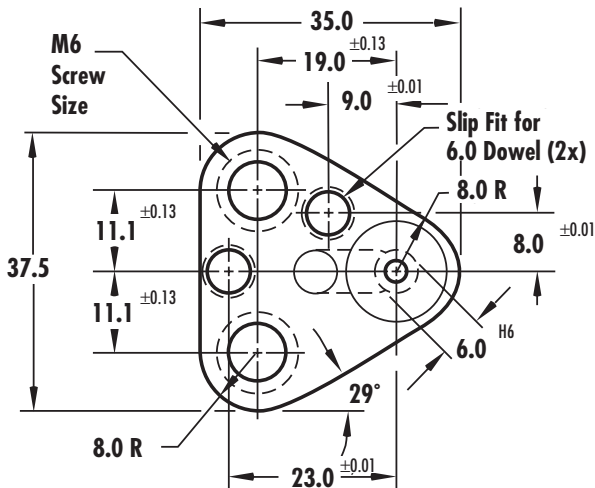
### For Small Holes and Limited Space Applications

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 Ø6, the TRN solves most mounting problems.

### TRN06 Retainer includes:

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

Light Duty



### How to order:

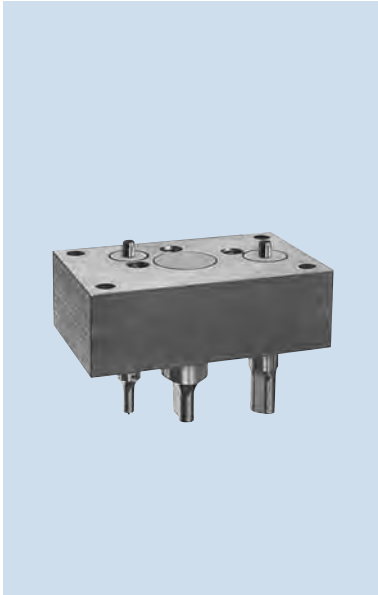
Specify: Quantity

12

Catalog No.

TRN06

## MULTI POSITION™ RETAINERS HEAVY DUTY TYPE BRP

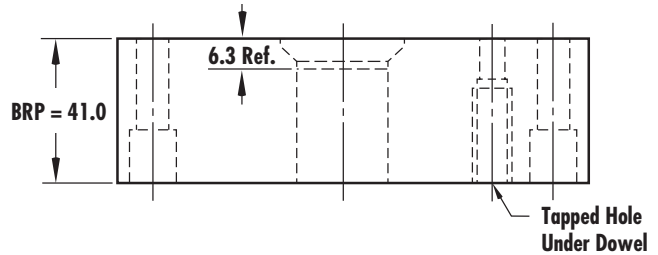
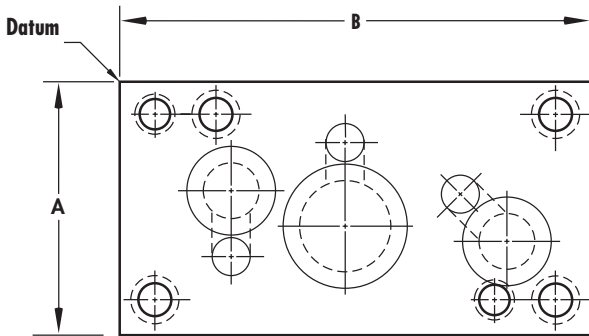


Dayton's innovative Multi-Position retainers provide a simple, low-cost solution to building new dies. These retainers reduce the need for special detailing, save both design and build time.

Multi-Position retainers are easy to order. Simply specify BRP for Heavy Duty Ball Lock retainers followed by the catalog number, hole locations and hole sizes. Order forms are available on request.

Using two Type A backing plugs eliminates the need for dowels in the retainer.

Heavy Duty



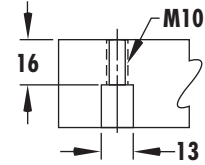
Ø Dowel	3	4	5	6	8	10	12	13	16
Tapped Hole	M5	M6	M8	M8	M10	M12	M16	M16	M20

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

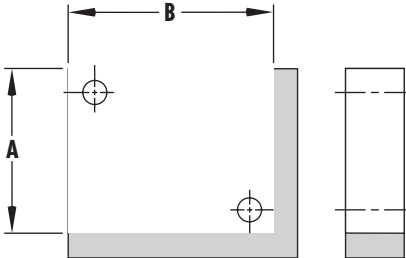


# Alterations for BRP Multi Position™ Retainers

**Standard Jackscrew Hole** Jackscrews make it easier to pull retainers off the dowels.

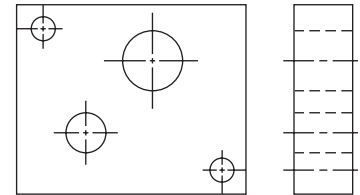


**Special Size** Any amount of material can be removed from the sides of the retainer for a customer size. Edges are sawcut  $\pm 0.8$



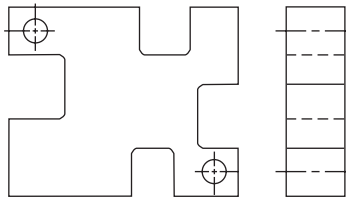
## Clearance Holes

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  $\pm 0.3$   
Diameter  $+0.4$



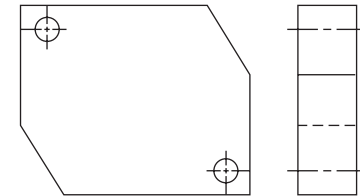
## Notches

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



## Angles

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



## Hole Locations from Datum

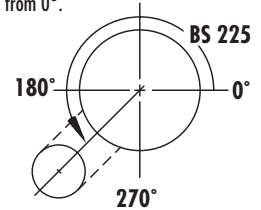
Dowel Hole  $\pm 0.01$   
Screw Holes  $\pm 0.13$   
Component Holes  $\pm 0.01$

## Punch drilling:

Punch Shape	Ball Hole Class	Radial Tolerance
Round	B	$\pm 5'$
Shape	BB	$\pm 0'5'$

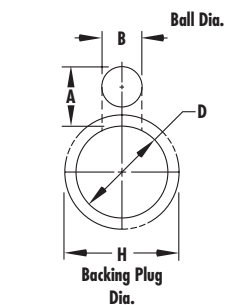
**Note:** Class BB provided unless otherwise specified.

Specify radial location in degrees  $90^\circ$  counterclockwise from  $0^\circ$ .



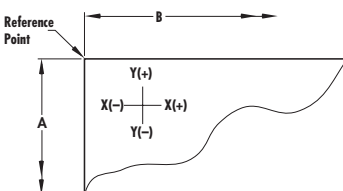
## Space Requirements

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
	40	17	12	46



## How to order:

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



Retainer	Catalog No.	Special Size					
<input checked="" type="checkbox"/> BRP <input type="checkbox"/> CRP	70175	A _____ B _____					
Multi-Position™ Retainers							
Hole No.	Type	Component Size	Location		Ball Hole		Backing Plug
			X Axis	Y Axis	Location	Class	Type
1	Dowel	DIN 7979 8.0x40	13.0	-13.0	-	-	-
2	Thread	M 10	35.0	-13.0	-	-	-
3	BJR	16	53.0	-35.0	$90^\circ$	BB	C
4	Additional hole	$\varnothing 33$	108.0	-27.0	-	-	-
5	Jackscrew	DIN 912 M 10x35	25.0	-25.0	-	-	-

You must specify all dimensions from datum.



# MULTI POSITION™ RETAINERS BACKING PLATE TYPE BRPBP

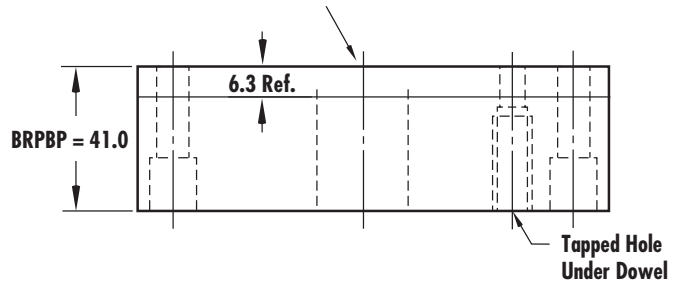
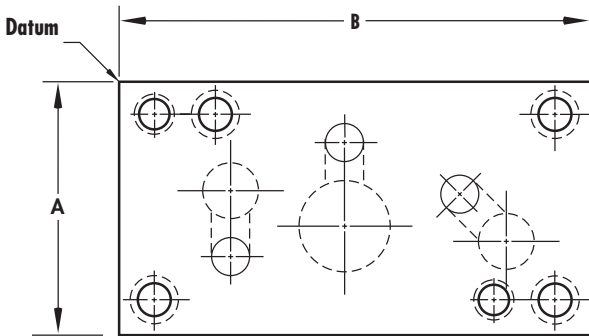


Dayton's innovative Multi-Position retainers provide a simple, low-cost solution to building new dies. These retainers reduce the need for special detailing, save both design and build time.

Multi-Position retainers are easy to order. Simply specify BRPBP for Heavy Duty Ball Lock retainers followed by the catalog number, hole locations and hole sizes. Order forms are available on request.

**Heavy Duty**

Backing Plate is fixed with two screws DIN 7991.  
Hole Position will be specified from DAYTON PROGRESS GmbH.

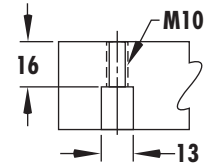


Ø Dowel	3	4	5	6	8	10	12	13	16
Tapped Hole	M5	M6	M8	M8	M10	M12	M16	M16	M20

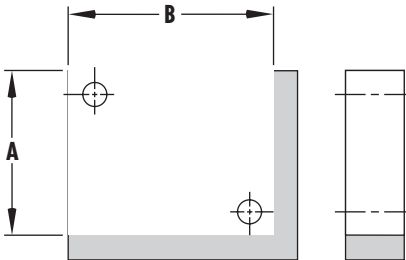
Type	A	B											
		60	70	80	90	100	125	150	175	200	225	250	300
BRPBP	50	5060	5070	5080	5090	50100	50125	50150	50175	50200	50225	50250	50300
BRPBP	60	6060	6070	6080	6090	60100	60125	60150	60175	60200	60225	60250	60300
BRPBP	70		7070	7080	7090	70100	70125	70150	70175	70200	70225	70250	70300
BRPBP	80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

# Alterations for BRPBP Multi Position™ Retainers

**Standard Jackscrew Hole** Jackscrews make it easier to pull retainers off the dowels.

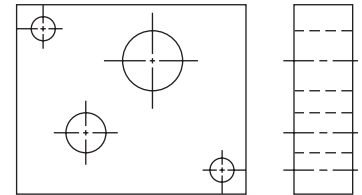


**Special Size** Any amount of material can be removed from the sides of the retainer for a customer size. Edges are sawcut  $\pm 0.8$



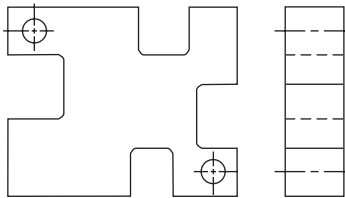
## Clearance Holes

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  $\pm 0.3$   
Diameter  $+0.4$



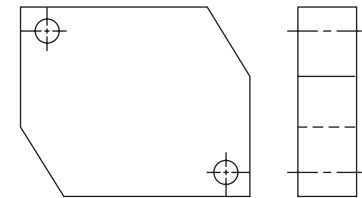
## Notches

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



## Angles

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



## Hole Locations from Datum

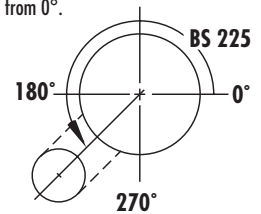
Dowel Hole  $\pm 0.01$   
Screw Holes  $\pm 0.13$   
Component Holes  $\pm 0.01$

## Punch drilling:

Punch Shape	Ball Hole Class	Radial Tolerance
Round	B	$\pm 5'$
Shape	BB	$\pm 0'5'$

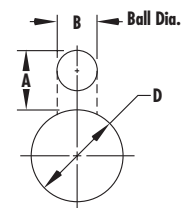
**Note:** Class BB provided unless otherwise specified.

Specify radial location in degrees  $90^\circ$  counterclockwise from  $0^\circ$ .



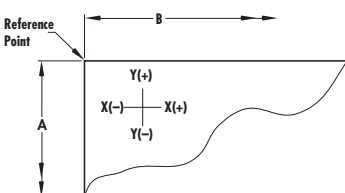
## Space Requirements

Type	D	A	B
BRPBP	10	15	10
BRPBP	13	17	12
BRPBP	16	17	12
BRPBP	20	17	12
BRPBP	25	17	12
BRPBP	32	17	12
BRPBP	40	17	12



## How to order:

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



Retainer		Catalog No.	Special Size				
<input checked="" type="checkbox"/> BRP	<input type="checkbox"/> CRP	70175	A _____		B _____		
Multi-Position™ Retainers							
Hole No.	Type	Component Size	Location		Ball Hole		Backing Plug
			X Axis	Y Axis	Location	Class	Type
1	Dowel	DIN 7979 8.0x40	13.0	-13.0	-	-	-
2	Thread	M 10	35.0	-13.0	-	-	-
3	BJR	16	53.0	-35.0	$90^\circ$	BB	C
4	Additional hole	$\varnothing 33$	108.0	-27.0	-	-	-
5	Jackscrew	DIN 912 M 10x35	25.0	-25.0	-	-	-

You must specify all dimensions from datum.



# MULTI POSITION™ RETAINERS LIGHT DUTY TYPE CRP

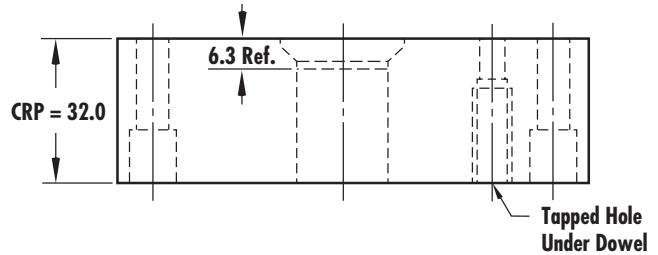
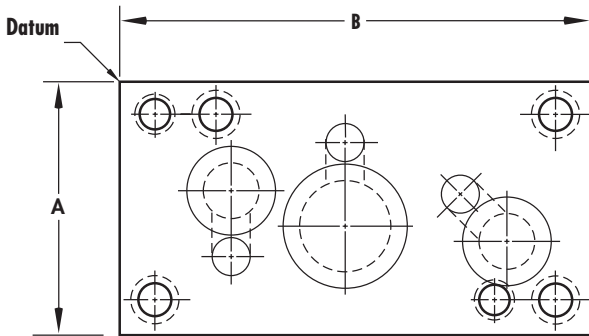


Dayton's innovative Multi-Position retainers provide a simple, low-cost solution to building new dies. These retainers reduce the need for special detailing, save both design and build time.

Multi-Position retainers are easy to order. Simply specify CRP for Light Duty Ball Lock retainers followed by the catalog number, hole locations and hole sizes. Order forms are available on request.

Using two Type A backing plugs eliminates the need for dowels in the retainer.

Light Duty

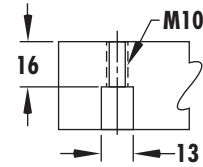


Ø Dowel	3	4	5	6	8	10	12	13	16
Tapped Hole	M5	M6	M8	M8	M10	M12	M16	M16	M20

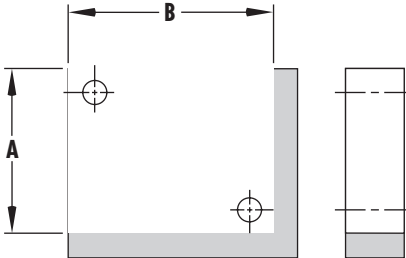
Type	A	B											
		60	70	80	90	100	125	150	175	200	225	250	300
CRP	50	5060	5070	5080	5090	50100	50125	50150	50175	50200	50225	50250	50300
CRP	60	6060	6070	6080	6090	60100	60125	60150	60175	60200	60225	60250	60300
CRP	70		7070	7080	7090	70100	70125	70150	70175	70200	70225	70250	70300
CRP	80			8080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

# Alterations for CRP Multi Position™ Retainers

**Standard Jackscrew Hole** Jackscrews make it easier to pull retainers off the dowels.

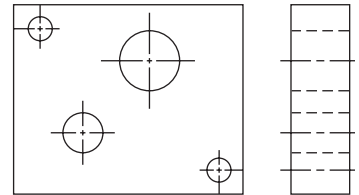


**Special Size** Any amount of material can be removed from the sides of the retainer for a customer size. Edges are sawcut  $\pm 0.8$

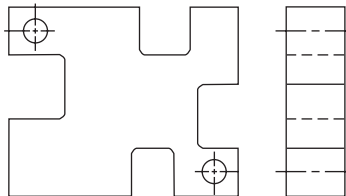


**Clearance Holes**

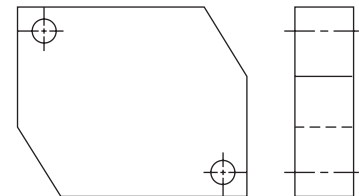
Clearance Holes or tapped holes can be detailed or shown in the chart like the order example below. Holes are drilled through the retainer unless otherwise specified. Location  $\pm 0.3$   
Diameter  $+0.4$



**Notches** Notches to clear other tooling can be added to any side of the retainer. Notches are sawcut  $\pm 0.8$



**Angles** Angles, like notches can be added to clear other tooling in the die. Angles are sawcut  $\pm 0.8$



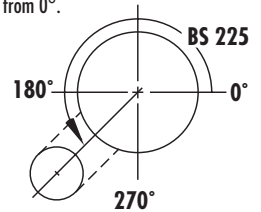
**Hole Locations from Datum**

- Dowel Hole  $\pm 0.01$
- Screw Holes  $\pm 0.13$
- Component Holes  $\pm 0.01$

Punch Shape	Ball Hole Class	Radial Tolerance
Round	B	$\pm 5^\circ$
Shape	BB	$\pm 0^\circ 5'$

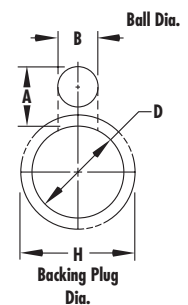
**Note:** Class BB provided unless otherwise specified.

Specify radial location in degrees  $90^\circ$  counterclockwise from  $0^\circ$ .



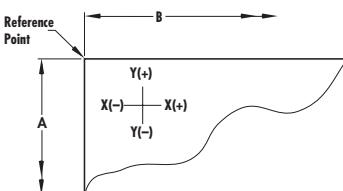
**Space Requirements**

Type	D	A	B	H
CRP	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



**How to order:**

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



Retainer	Catalog No.	Special Size					
<input type="checkbox"/> BRP <input checked="" type="checkbox"/> CRP	70175	A _____ B _____					
Multi-Position™ Retainers							
Hole No.	Component		Location		Ball Hole		Backing Plug Type
	Type	Size	X Axis	Y Axis	Location	Class	
1	Dowel	DIN 7979 8.0x40	13.0	-13.0	-	-	-
2	Thread	M 10	35.0	-13.0	-	-	-
3	BJR	16	53.0	-35.0	$90^\circ$	BB	C
4	Additional hole	$\varnothing 33$	108.0	-27.0	-	-	-
5	Jackscrew	DIN 912 M 10x35	25.0	-25.0	-	-	-

You must specify all dimensions from datum.



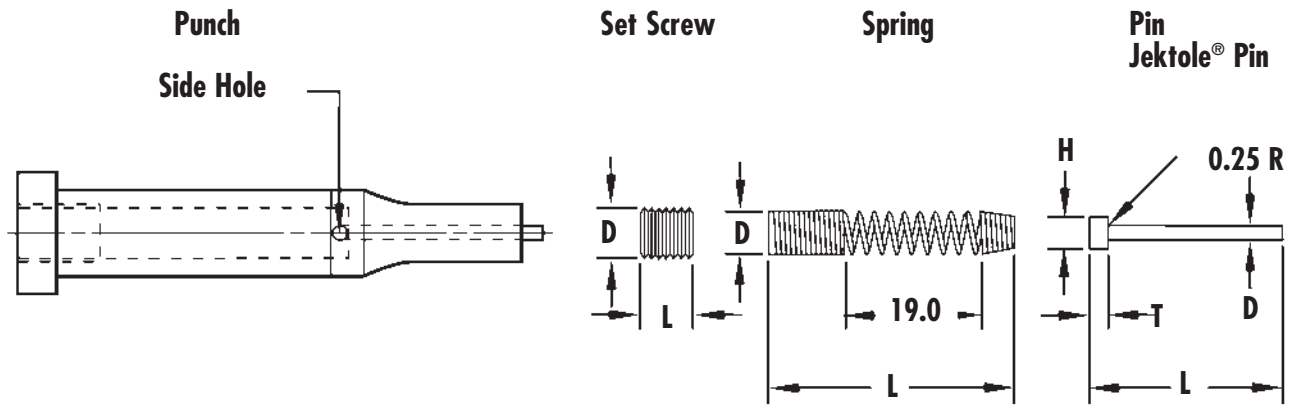


## Jektole® in Production

- Requires less press tonnage
- Reduces pressure required to strip the punch... which in turn reduces punch wear
- Produces minimal burr
- Doubles (and often triples) piece output per grind
- Reduces total punch costs

## Jektole® in Maintenance

- Keeper Key – holds pin in retracted position
- Eliminates the need for disassembly before grinding
- Maintains proper pin extension
- Reduces downtime for re-grinding



## Universal Jektole® Components

Ejector Pins	J2M	J3M	J4M	J6M	J9M	J12M
Overall Length	L 28.0	35.0	49.4	49.4	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	L 5.0	5.0	5.0	5.0	6.0	6.0

## Jektole® Design Limits

Dimensions	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 Length	32	38	41	41	41	41
Max. Shank Length	S 87	87	84	84	84	70

## CLASSIFIED SHAPES

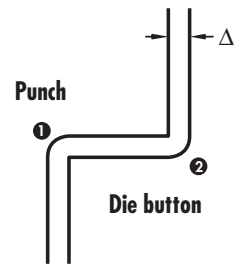
### Clearance

Fillets matched with sharp corners reduces the clearance per side  $\Delta$ . If the clearance is 0.04  $\Delta$  or less, Dayton will break sharp corners when the punches and/or guides and die buttons are ordered together. This reduces assembly time and the risk of edge breaking during operation.

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 die button.
- ② 0.2 max fillet on the die button matching corner sharp on the punch.



### Shape Center

Shapes are centered on punch shanks as shown.

Shapes in guide bushings and die buttons are also centered as shown with the exception of shapes C22 and C34. Due to clearance, the P dimension on these shapes will not be centered.

### Corner Dimensions

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

# 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

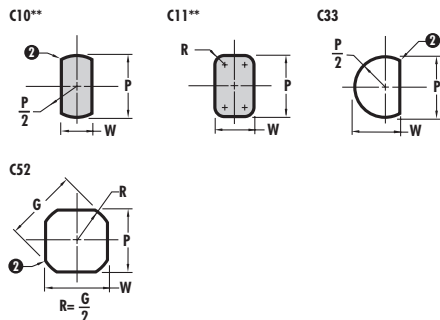
Custom Ball Seat locations can be specified as BS and degree counterclockwise from 0°.

## Simplified Specifications

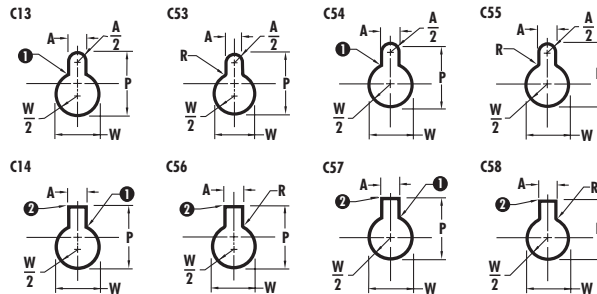
83 Common Shapes – No Detailing Required

90°

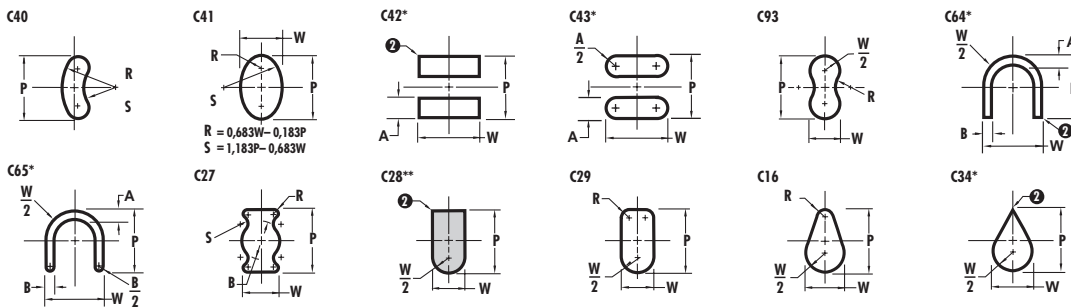
### Flatted Rounds



### Mono Lobes



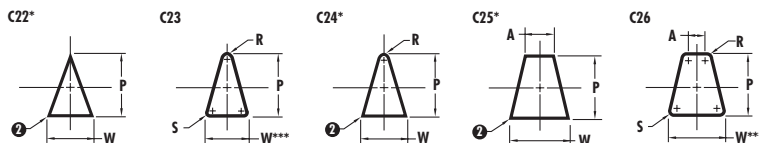
### Miscellaneous



180°

0°

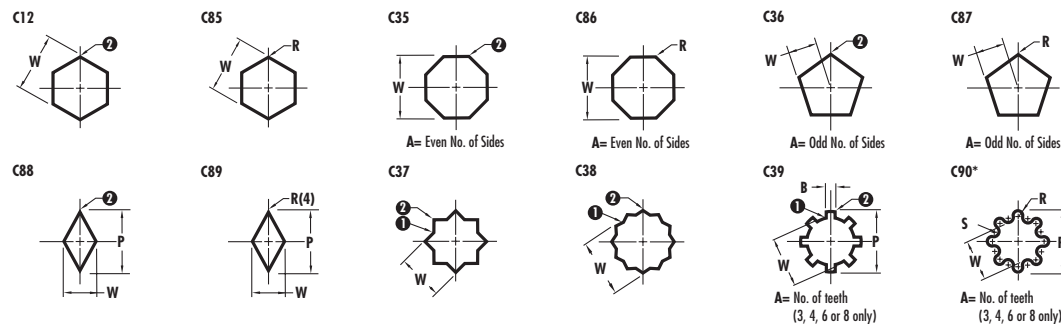
### Triangles/Trapezoids



\*\* Now a standard shape.

\*\*\* Tangential

### Polygons

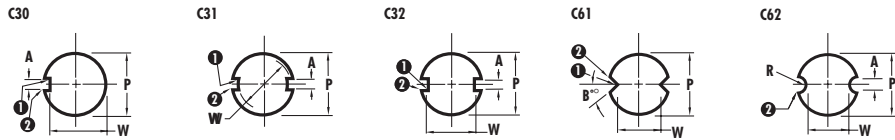


270°

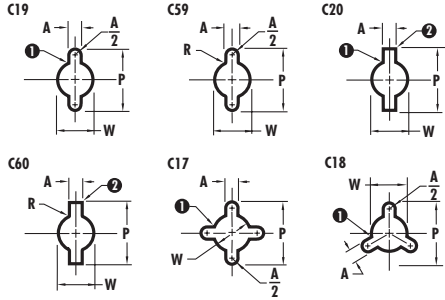


90°

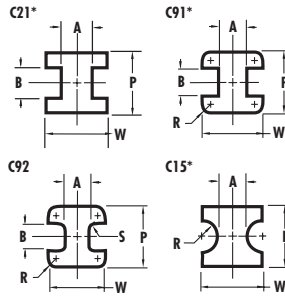
**Keys**



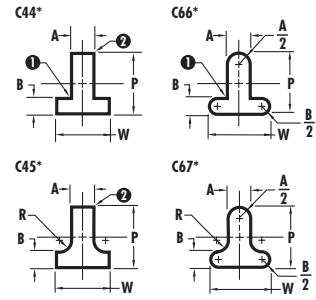
**Multi Lobes**



**Duo Tees**

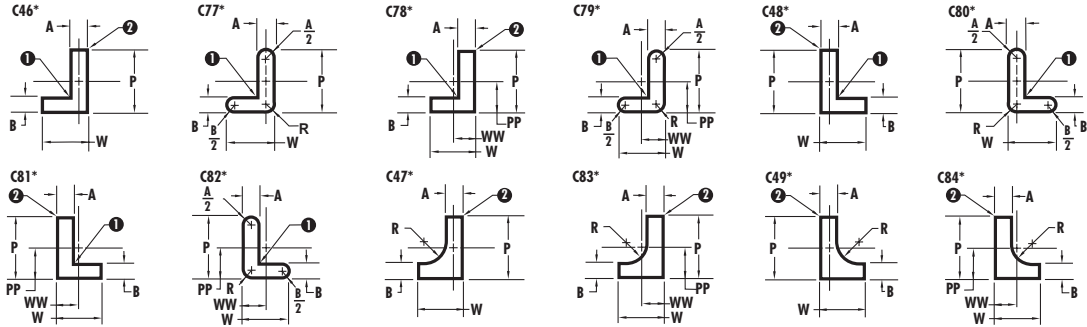


**T's**



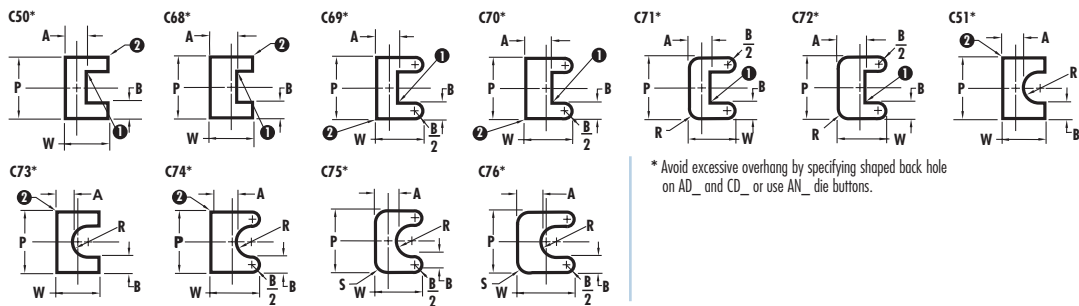
**L's**

180°



0°

**U's**



\* Avoid excessive overhang by specifying shaped back hole on AD\_, and CD\_, or use AN\_ die buttons.

270°

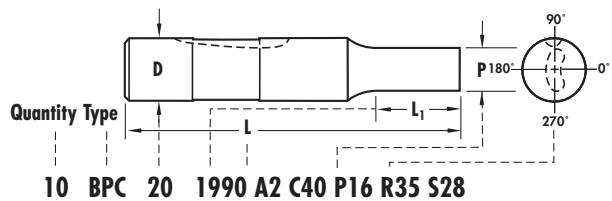
1 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners if die button is ordered with punch to eliminate interference with the button fillet when total clearance is 0.08 or less.

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

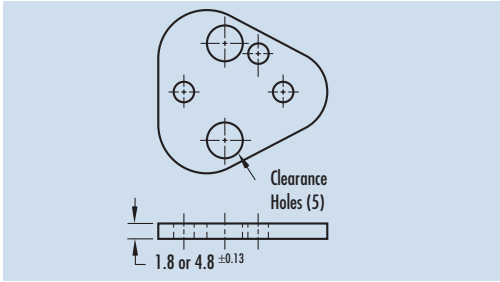
$$G = \sqrt{P^2 + W^2}$$

**How to order:**

- Specify: Quantity  
Type  
Shank Diameter  
Point & Overall Length  
Steel  
Standard Alterations  
P or P&W Dimensions

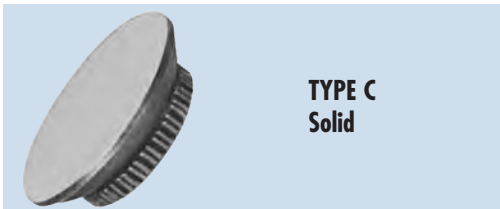
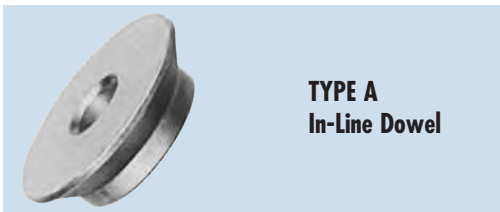


## SHIM PLATES/BACKING PLATES



Retainer	D	Shim Plate t=1,8 (soft)	Backing Plate t=4,8 (HRC55)
BRT/CRT	10	URSP 1018	URBP 1048
BRT/CRT	13	URSP 1318	URBP 1348
BRT/CRT	16	URSP 1618	URBP 1648
BRT/CRT	20	URSP 2018	URBP 2048
BRT/CRT	25	URSP 2518	URBP 2548
BRT/CRT	32	URSP 3218	URBP 3248
CRT	38	URSP 3818	URBP 3848
BRT	40	URSP 4018	URBP 4048














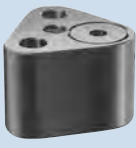

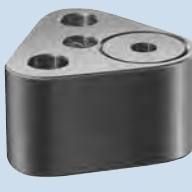

## BACKING PLUG



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.

**Matrix Retainers require detailed drawings.**

# RETAINER ACCESSORIES

		Catalog Numbers/Sizes										
		Backing Plugs Retainers			Socket Head Cap Screw	Ball Release Screw	Dowel	Ball	Standard Spring	Extra Heavy Duty Spring	Booster Spring	Retainer Drill Bushing
		CRT und BRT	Multi-Position™									
		Type A	Type B*	Type C								
												
		Standard	Optional	Standard								
<b>Heavy Duty</b> <b>BRT</b>  <b>BRTBS</b>  <b>NRT</b> 	10	268488	—	266086				268836 Ø 10	268976	269018	269026	268372
	13	268534	—	266094	574554 M8x45							268399
	16	268542	—	266108								268402
	20	—	—	—	574597 M10x50	268968 M4x12	260037 Ø 6x20	268844 Ø 12	268933	269034	269042	268429
	25	268577	—	266124								268437
	32	268585	—	266132	574694 M12x50							268445
40	268593	—	—								—	
<b>Light Duty</b> <b>CRT</b>  <b>TRT</b>  <b>TRN</b> 	10	268488	—	266086								268372
	13	268534	266159	266094	574538 M8x35							268399
	16	268542	266167	266108								268402
	20	268569	266175	266116	574589 M10x40	268968 M4x12	260037 Ø 6x20	268828 Ø 8	268909	—	—	268429
	25	268577	266183	266124								268437
	32	268585	266191	266132	574635 M12x40							268445
38	268453	266205	—								—	
06	268518	—	266078	574511 M6x35	268984 M3x15	574651 Ø 3x20 260037 Ø 6x20	268801 Ø 6	268895	—	—	268275	

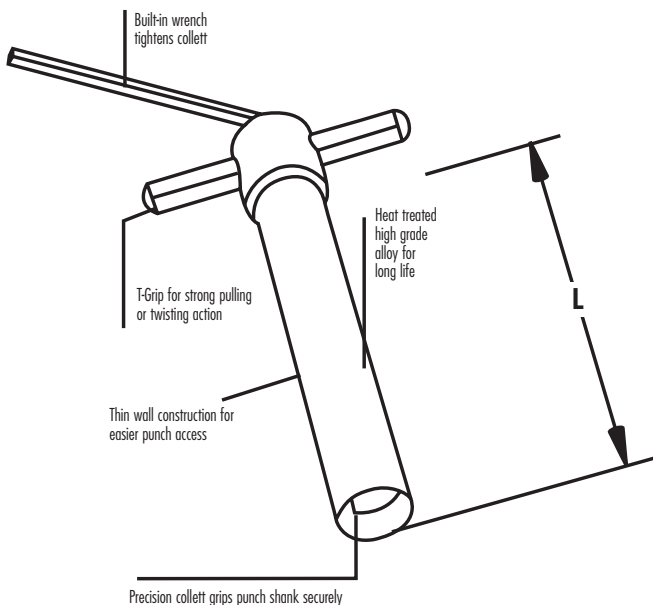
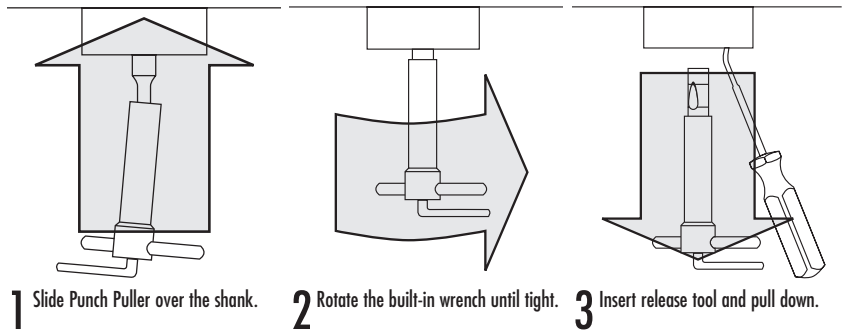
## PUNCH PULLERS



### 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 RELEASE TOOLS



Angle Tip  
Cat. No. 818038



Straight Tip  
Cat. No. 818046



Threaded Tip  
Cat. No. 269999

## PUNCH GAUGE

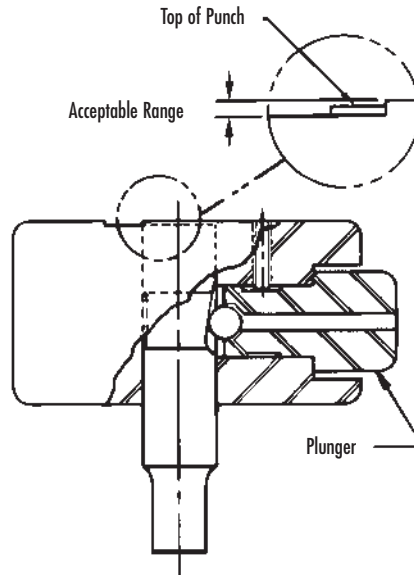
Dayton Ball Lock Punch Gauges are used to check the location of the ball seat. A properly located ball seat assures you that when the punch is inserted into a retainer manufactured to ANSI Standard you will have proper engagement and will have eliminated unsafe locking conditions.

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 gauge you can check a punch before putting it into the die to guarantee the locking function will not cause any costly downtime.

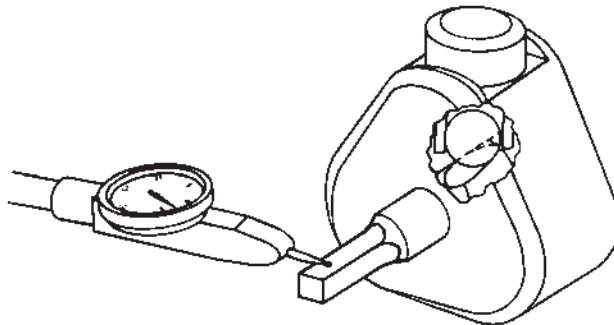
### Check Ball Seat

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



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

