Lane®
PUNCH CORPORATION

تامین کننده قطعات استاندارد قالب

www.avrinco.com info@avrinco.com

۰۹۱۲۸۴۷۶۵۹۶ ۰۹۱۲۳۸۵۱۰۴۴

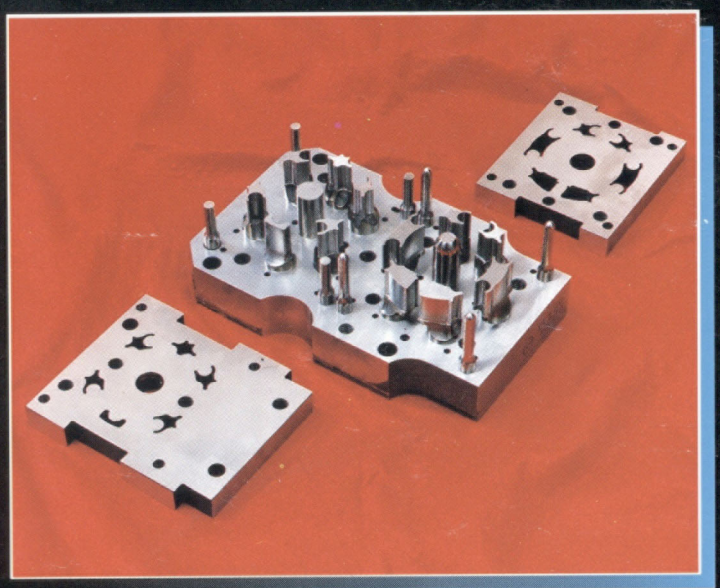
instagram: @avrinco_ تلفن: ۰۲۱-۴۴۱۳۳۱۵۱

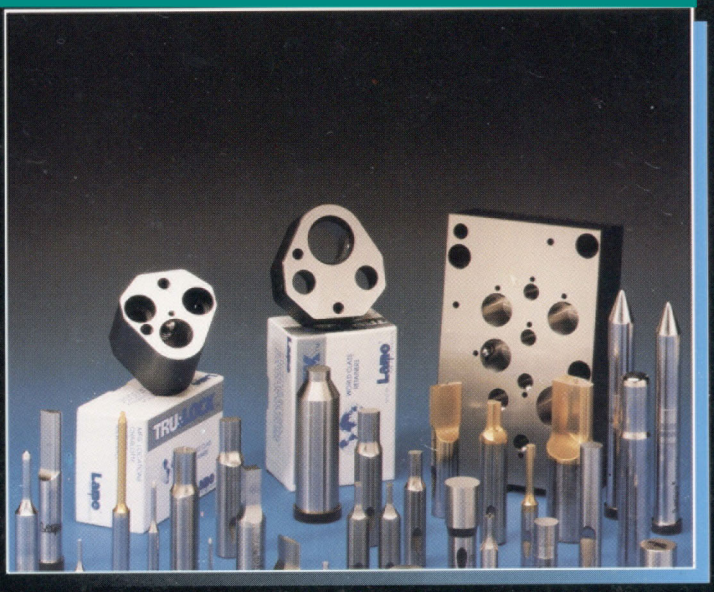
تجهیز قالب اورین

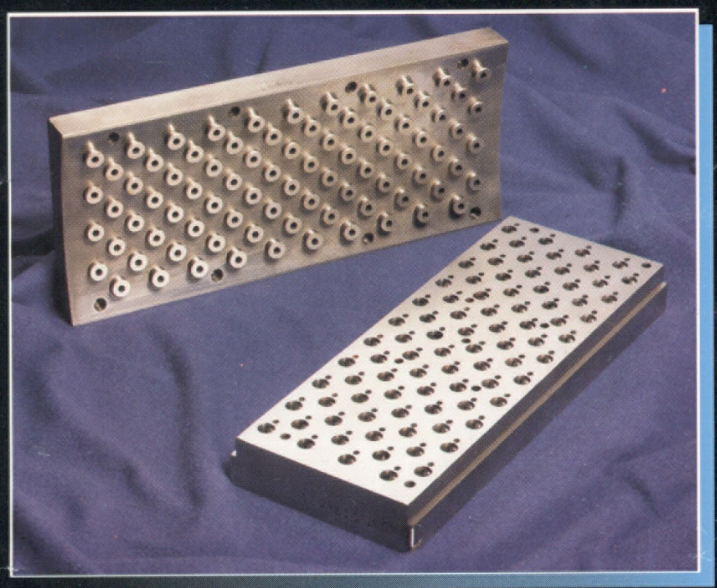


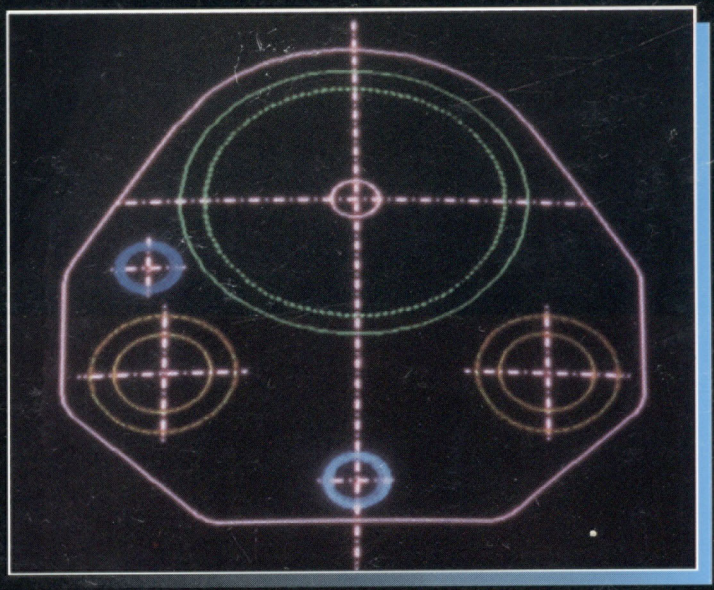
عاملیت فروش قطعات استاندارد در ایران

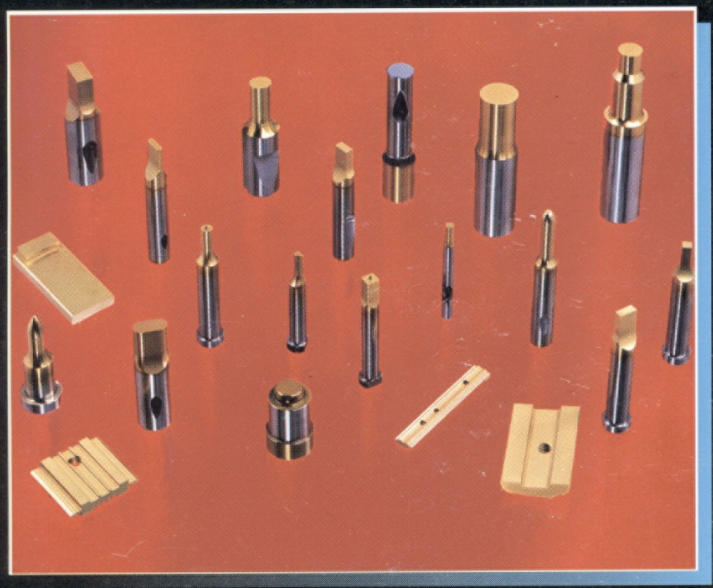
AZOL-GAS CODIPRO PUNCH INDUSTRY CO., LTD. Lane® PUNCH CORPORATION ORSA™ BKM BURSA KALIP MERKEZİ











PUNCH CATALOG AND TECHNICAL MANUAL

METRIC PRODUCTS #9501



Lane Punch Corporation is pleased to introduce our new **Metric Punch Catalog and Technical Manual**. This catalog has taken an enormous amount of effort in planning and development with the goal of being user friendly and customer focussed.

The **Lane Logical Numbering System**™ used throughout this catalog is, without doubt, the most significant development from the punch industry in the last twenty years. Every letter and number has a true meaning. This makes the system easy to learn and more cost effective to use. It saves time and reduces errors.

In this catalog you will find many innovative new products not previously offered: **Tru-Lock**® **Retainers**, including the new **Lane Economy Ball-Lock Retainer**, a real cost-saver; **Rap-I-Die**™ interchangeable die components for customer convenience and speed; **General (Press-Fit) Numerical**, an excellent choice for CNC die building; and a technical section loaded with information to make your job easier.

We would like to thank the many customers who helped us develop this catalog, including engineers, buyers, toolroom foremen, tool and die makers, press operators and technicians. It would not have been possible without your valuable contributions.

Policy, terms and conditions can be found in the Technical section.
© 1995 Lane Punch Corporation. All rights reserved.

Global Customer Support

Lane PUNCH CORPORATION

Since 1966 Lane Punch Corporation has been manufacturing *metric*, interchangeable punches and die components. Recognizing the importance of supporting customers throughout the world, we have developed a strategic plan to provide customers with the best quality and service available worldwide.



تامین کننده قطعات استاندارد قالب

www.avrinco.com info@avrinco.com

۰۹۱۲۳۸۵۱۰۴۴ ۰۹۱۲۸۴۷۶۵۹۶ تجهیز قالب اورین

تلفن: ۰۲۱-۴۴۱۳۳۱۵۱ instagram: @avrinco_



عاملیت فروش قطعات استاندارد در ایران

AZOL-GAS CODIPRO PUNCH INDUSTRY CO., LTD. Lane PUNCH CORPORATION ORSA BKM BURSA KALIP MERKEZİ

Lane PUNCH CORPORATION — Logical Numbering System™

Thoughout this catalog please note the use of the **Lane Logical Numbering System.** Keyed by four letters, every letter and number has an intelligent, logical meaning. It can be learned in minutes and is easy to remember. It allows the engineer or buyer to tell at a glance all information about the product being listed. This results in fewer ordering errors and increased productivity.

Example:

B P H R™ 13 - 19 - 100 M2 P6.0

Catalog Line
B = Ball Lock

Product
P = Punch

Type
H = Heavy Duty

Shape
R = Round

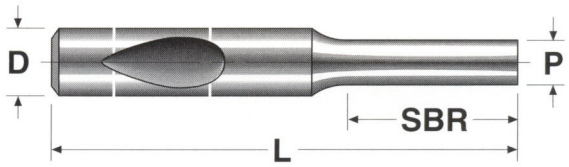
Shank Diameter
D = 13

Point Length
SBR = 19

Overall Length
L = 100

Steel
M2 HSS Steel

Point Size
P = 6.00



List of Lane Logical Letter Designators

Catalog Line	Product	Type	Shape
B Ball-Lock™ Quick Change	**P** Punch	**L** Light duty	**R** Round
G General™ Economy Press-Fit	**E** Ejector punch	**H** Heavy duty	**O** Oblong
P Peerless™ The Ultimate in Close Tolerance	**B** Button die	**E** Extra heavy duty	**S** Square/rect.
	R Retainer	**S** Shoulder	**H** High production
	Q Quill punch	**P** Press-fit	**P** Parabolic pilot
	G Guide bushing	**N** Numerical	**A** Angular pilot
	I Inverted punch	**B** Bevel head	**B** Blank
	N Nose-over ejector	**U** Up-head	**C** Classified shape
	H Holder	**D** Down-head	**D** Draw/extrusion
	D Die section	**R** Reduced "D"	**M** Multi-hole
		W Wire-cut	**T** Tru-Lock
			E End

© 1995 Lane Punch Corporation. All rights reserved.

Lane PUNCH CORPORATION

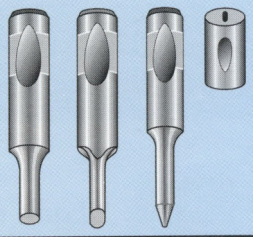
METRIC PRODUCTS CATALOG

SUMMARY OF CONTENTS

Ball-Lock Punches and Die Buttons

PAGES B1–B33

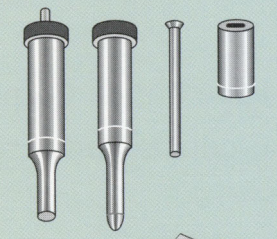
- Light, Heavy and Extra-heavy duty Ball-Lock Punches in standard Round, Oblong, Square/Rect. and High Production shapes.
- Nose-over Ejector Punches and Inverted Solid Punches in Heavy and Light duty
- Angular and Parabolic point Pilots in Heavy and Light duty
- Lane's Z-Bottoming Punch-Retainer coordinated design gives maximum point-larger-than-shank rigidity



General™ (Press-Fit) Punches and Die Buttons

PAGES G1–G29

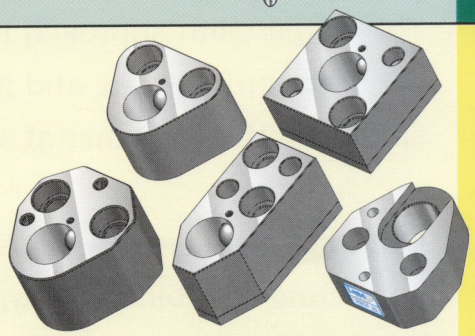
- General Numerical *in-line dowel* Punches for CNC mounting
- General Ejector, solid Shoulder and Quill Punches and Blanks to ISO 8020 and 8021 standards
- Press-Fit and solid Shoulder Die Buttons and Blanks to ISO 8977 standards
- Press-Fit Die Buttons now in diameters up to 100mm



Standard Retainers

PAGES SR1–SR15

- TRU&LOCK® and Economy Ball-Lock™ Retainers in both Heavy and Light duty for guaranteed precision and rapid interchangeability
- ISO-Style End and Square Retainers in Heavy and Light duty; Extra-heavy Square Retainers to diameters of 63mm
- General and Peerless Retainers for Shoulder Punches with Round or Formed/shaped points

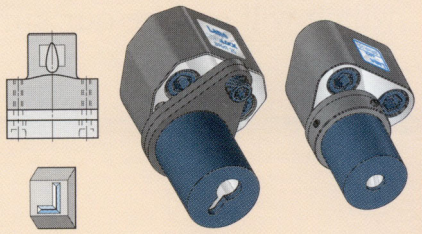


Strippers & Stamps

PAGES S1–S7

Lane offers the most complete line of Urethane Strippers available, including TRU&LOCK®, Open-end and Closed-end Strippers. Lane also offers both a Stripper Plate Assembly and our new Stripper Collar Assembly to attach TRU&LOCK® Strippers to Retainers.

For added design convenience, a line of lettering/numbering Stamps and Stamp Holders are now available.

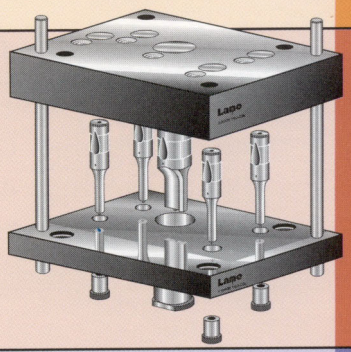


Rap-i-Die™ Retainers (Multi-hole)

PAGES R1–R15

Off-the shelf Rap-i-Die plates with *in-line dowel* work with manual and CNC mounting. Included in the Rap-i-Die Concept are:

- Ball-Lock and Peerless Multi-hole Retainer Plates, both for Ball-Lock and Shoulder Punches and for Press-Fit and Shoulder Die Buttons
- Peerless Wire EDM Multi-hole Die Plates and Strippers
- Peerless Backing Plates



Peerless™ Shoulder Punches and Die Buttons

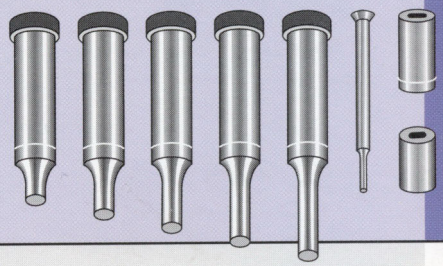
PAGES PS1–PS13

The **ultimate in precision** Ejector Punches, Solid Punches, Die Buttons and Guide Bushings in A2, M2 and PS steels:

- Point size tolerances: +0.005, -0.000
- Point-to-shank concentricity: 0.008

Available options for demanding applications:

- **Multiple Point Lengths** for Ejector and Shoulder Punches
- **Wear-Resistant Coatings**



Technical Information

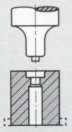
PAGES T1–T31

Reference information, including:

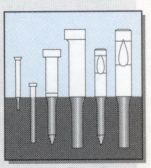
- The Lane *Logical Numbering System* and Ordering Examples
- Standard Alterations & custom design practices
- A wide range of Ball-Lock data
- Stamping & stripping forces; steel selection
- Metric tolerances & conversions



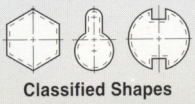
Key Locking Devices



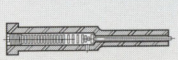
Drawing/Extrusion Punches & Die Buttons



Wear Coatings



Classified Shapes



Ejector Components

©1995 Lane Punch Corporation
All rights reserved.

Mission Statement

*Lane is **Quality Certified** with the Automotive Industry Worldwide.*

Lane Punch Corporation will develop, manufacture and market high quality products and services while being competitive world-wide.

Through a team approach to managing and continuous improvement at all levels of our manufacturing and marketing organization, our efforts will be focused on satisfying the customer at all times.

Our long-term growth and stability will be based on our technical expertise and marketing capability. We will strive to be the industry leader in product excellence and customer service and to achieve better than average return on investment which will ensure our survival as an effective organization.

Lane RapidTrack™ System

BPHR 13-19-100 M2 P10.3

Customer Orders are tracked by Bar Code from Order Entry until it reaches the Customer's Dock. In this Lane uses the latest state-of-the-art Computer Integrated Manufacturing.

JIT Shipping Schedule

Most items listed in this catalog are included in the Lane JIT Shipping Schedule. 24-Hour Emergency Service is available on most items; contact any Lane Plant or Distributor for details.

ISTA

INDUSTRIAL DISTRIBUTORS

NTMA PRECISION

PMA PRECISION METALFORMING ASSOCIATION

NAPM NATIONAL ASSOCIATION MANUFACTURERS

ISO ADVISOR

© 1995 Lane Punch Corporation. All rights reserved.

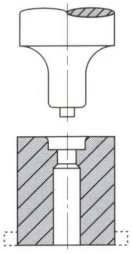
TECHNICAL INFORMATION TABLE OF CONTENTS

Lane PUNCH CORPORATION

PAGES T1–T2

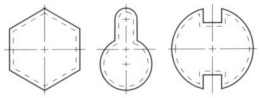
Logical Numbering System™

PAGES T3–T4



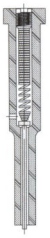
Drawing/Extruding Punches & Die Buttons

PAGES T5–T7



Classified Shapes

PAGE T8



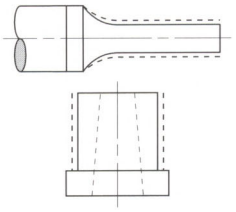
Ejector Components

PAGES T9–T10



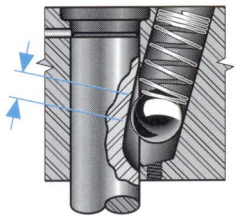
Key Locking Devices

PAGES T11–T12



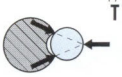
Standard Alterations: Punches & Die Buttons

PAGE T13

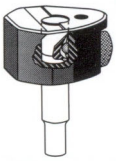


Ball-Lock Terminology

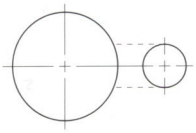
Ball-Lock System of Retention PAGE T14



Ball-Lock Gaging PAGE T15

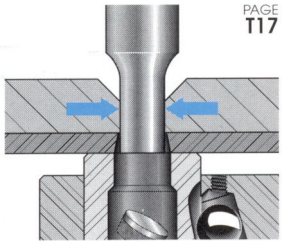


PAGE T16



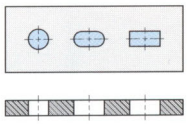
Ball-Lock Space Requirements

PAGE T17



Ball-Lock Stripping Forces

PAGE T18



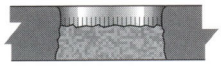
Stamping/Stripping Forces

PAGE T19

STEELS			
STAINLESS STEELS			
ALUMINUM BASE			
COPPER BASE			
MISC. METALIC			

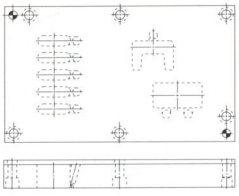
Stength of Materials

Punch-to-Die Clearances PAGE T20



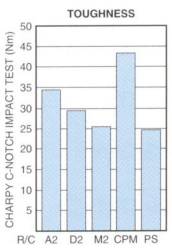
Recommended Design Practices PAGE T21

PAGE T22



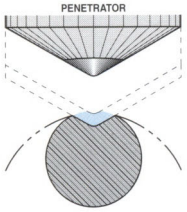
Ball-Lock Wire EDM Concept

PAGE T23



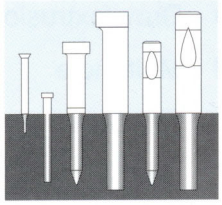
Steel Selection

PAGE T24



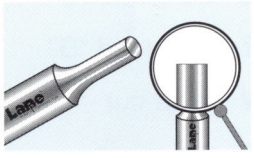
Punch Hardness Testing

PAGES T25–T26



Wear Coating: Punches & Die Buttons

PAGE T27



Quality/Cost Advantages; Punch Point Tips

Lane Total Quality; JIT Shipping PAGE T28

Tolerances; Metric-to-Inch Table PAGE T29

g5	m4	m5	n4	n5	H6	H7

Lane Policies, Terms and Conditions PAGE T30

Lane Plant Locations PAGE T31

Lane PUNCH CORPORATION — Logical Numbering System™

The **Lane Logical Numbering System** is keyed by four letters. It can be learned in minutes. It's easy to remember and allows the engineer or buyer to tell at a glance all information about the product being listed. This results in fewer ordering errors and increased productivity.

Example:

B P H R™ 13 - 19 - 100 M2 P6.0

Catalog Line
B = Ball Lock

Product
P = Punch

Type
H = Heavy Duty

Shape
R = Round

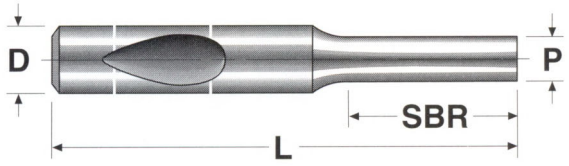
Shank Diameter
D = 13

Point Length
SBR = 19

Overall Length
L = 100

Steel
M2 HSS Steel

Point Size
P = 6.00



List of Lane Logical Letter Designators

Catalog Line

B Ball-Lock™ *Quick Change*



G General™ *Economy Press-Fit*



P Peerless™ *The Ultimate in Close Tolerance*



Product

P	Punch
E	Ejector punch
B	Button die
R	Retainer
Q	Quill punch
G	Guide bushing
I	Inverted punch
N	Nose-over ejector
H	Holder
D	Die section

Type

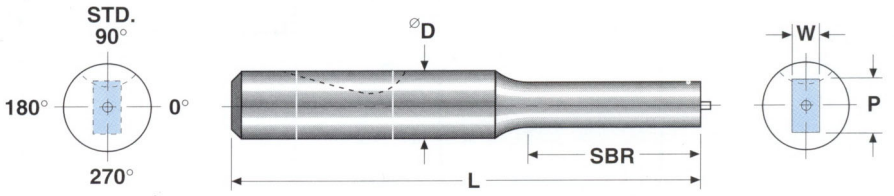
L	Light duty
H	Heavy duty
E	Extra heavy duty
S	Shoulder
P	Press-fit
N	Numerical
B	Bevel head
U	Up-head
D	Down-head
R	Reduced "D"
W	Wire-cut

Shape

R	Round
O	Oblong
S	Square/rect.
H	High production
P	Parabolic pilot
A	Angular pilot
B	Blank
C	Classified shape
D	Draw/extrusion
M	Multi-hole
T	Tru-Lock
E	End

© 1995 Lane Punch Corporation. All rights reserved.

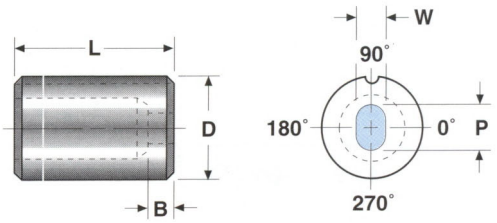
Ball-Lock
Ordering Example



Ball-Lock — Catalog Line
Ejector Punch — Product
Heavy Duty — Type
Square/Rectangle — Point Shape

Shank Dia. "D"	Point Length "SBR"	Overall Length "L"	Steel	"P" Dimension	"W" Dimension	Ball Seat Location
B E H S™	13 - 19 - 100		M2	P8.0	W6.0	BS 90°

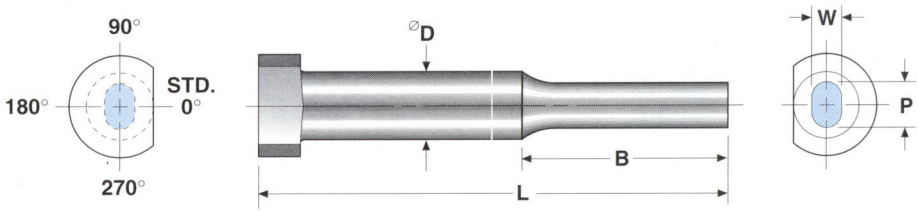
General
Ordering Example



General — Catalog Line
Button Die — Product
Press-Fit — Type
Oblong — Point Shape

Shank Dia. "D"	Land "B"	Overall Length "L"	Steel	"P" Dimension	"W" Dimension	Key Type & Location
G B P O™	25 - 6 - 25		A2	P14.21	W6.70	K0 90°

Peerless
Ordering Example



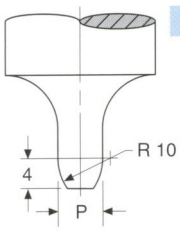
Peerless — Catalog Line
Punch — Product
Shoulder — Type
Oblong — Point Shape

Shank Dia. "D"	Point Length "B"	Overall Length "L"	Steel	"P" Dimension	"W" Dimension	Key Type & Location
P P S O™	13 - D - 90		M2	P10.0	W5.0	K2 0°

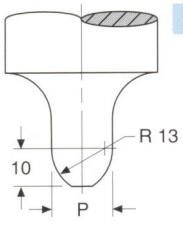
© 1995 Lane Punch Corporation. All rights reserved.

Ordering Example:

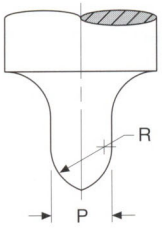
Select desired **Punch Style**	Select **Punch Blank** that desired **Draw Punch** is to be made from.	Punch Blank becomes **Draw Punch**	Enter **Shank Size**	Enter **SBR** or **B**	Enter **Overall Length**	Enter Steel: **A2**, **M2** or **PS**	Enter shape's **D number**	List additional **Letters** and **Dimensions** for D number selected
1. Ball-Lock	**BPHB** page B13	BPHD						
2. General Shoulder	**GPSB** page G12	GPSD						
3. Peerless Shoulder	**PPSB** page PS6	PPSD						



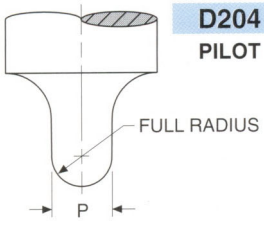
D201
PILOT



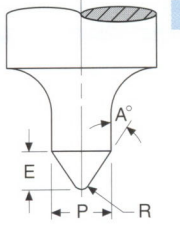
D202
PILOT



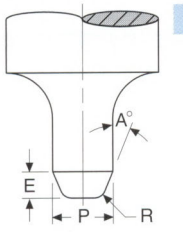
D203
PILOT



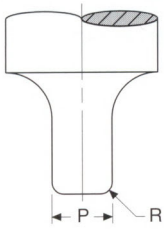
D204
PILOT



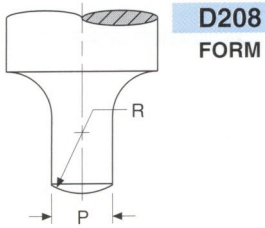
D205
PILOT



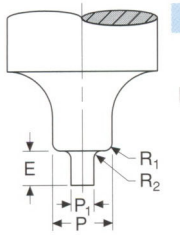
D206
PILOT



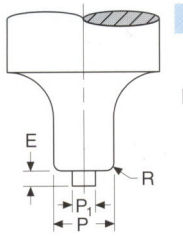
D207
EXTRUSION



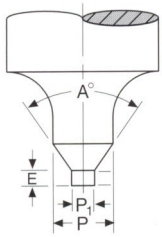
D208
FORM



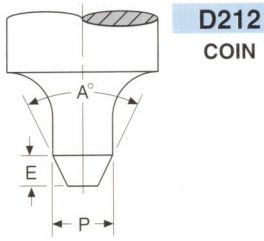
D209
PIERCE & EXTRUDE



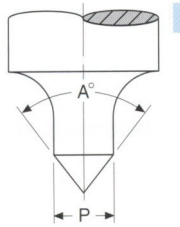
D210
PIERCE & EXTRUDE



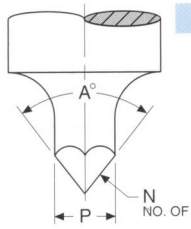
D211
PIERCE & COUNTER-SINK



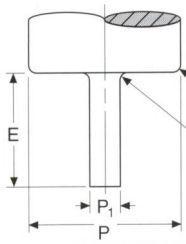
D212
COIN



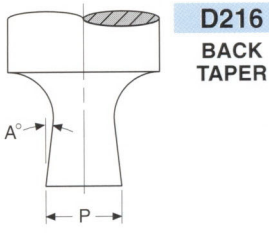
D213
CONE POINT



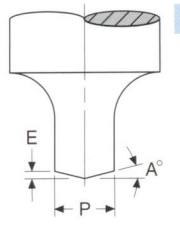
D214
NAIL POINT



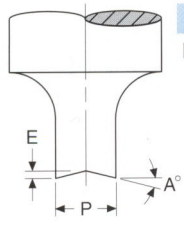
D215
PIERCE FORM



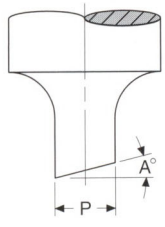
D216
BACK TAPER



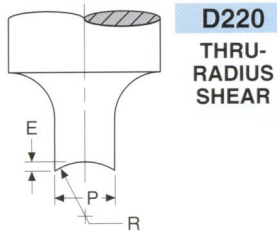
D217
CHISEL POINT



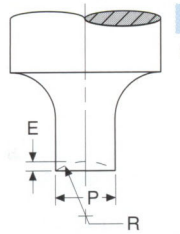
D218
ROOFTOP SHEAR



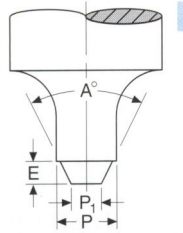
D219
ANGLED SHEAR



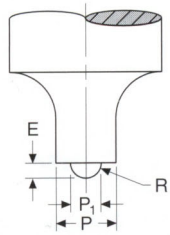
D220
THRU-RADIUS SHEAR



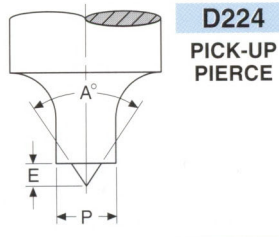
D221
CONCAVE SHEAR



D222
COIN



D223
DIMPLE



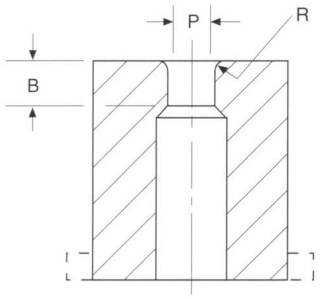
D224
PICK-UP PIERCE

© 1995 Lane Punch Corporation. All rights reserved.

Ordering Example:

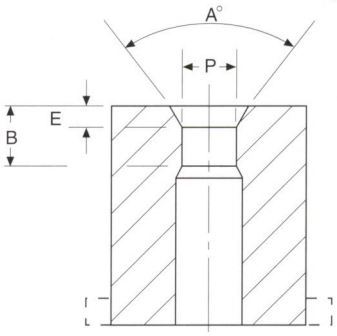
Select desired **Die Button Style**	Select **Die Button Blank** that desired **Draw Button** is to be made from.	Button Blank becomes **Draw Button**	Enter **BODY Size**	Enter **Overall Length**	Enter Steel: **A2, M2** or **PS**	Enter shape's **D number**	List additional **Letters** and **Dimensions** for D number selected
1. Ball-Lock Button	**BBLB** page B33	BBLD					
2. General Button	**GBSB** page G29	GBPD					
3. Peerless Button	**PBSB** page PS9	PBSD					

D301



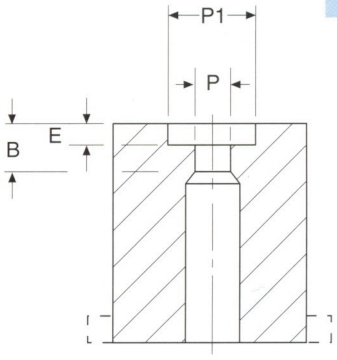
P= _____
R= _____
B= _____

D302



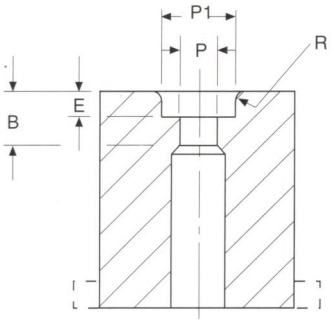
A= _____ E= _____
B= _____ P= _____

D303



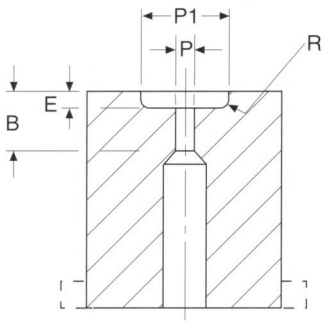
B= _____ P1= _____
E= _____ P= _____

D304



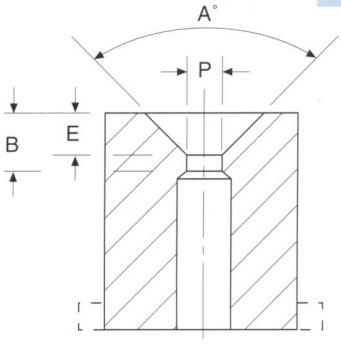
B= _____ P= _____
E= _____ R= _____
P1= _____

D305



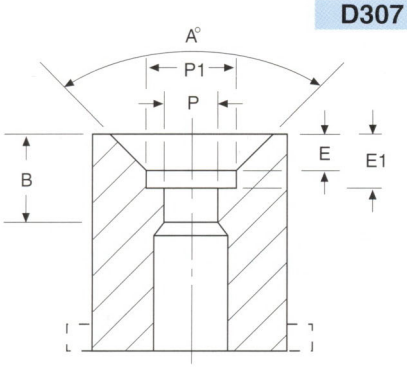
B= _____ P= _____
E= _____ R= _____
P1= _____

D306



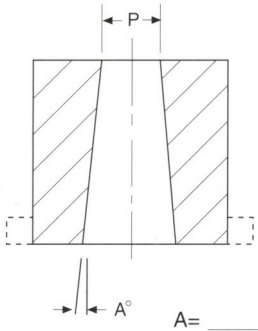
A= _____ E= _____
B= _____ P= _____

D307



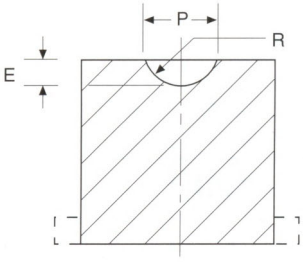
A= _____ P1= _____
B= _____ P= _____
C= _____ R= _____

D308



A= _____
P= _____

D309



E= _____
P= _____
R= _____

© 1995 Lane Punch Corporation. All rights reserved.

Ball-Lock Punch Blanks: pages B5, B13, B19, B27
General Punch Shoulder Blanks: pages G5, G12, G24
Peerless Punch Shoulder Blanks: page PS6

NOTE:
All views in Die Position

Ball-Lock Die Button Blank: page B33
General Die Button Blanks: page G29
Peerless Die Button Blanks: page PS9

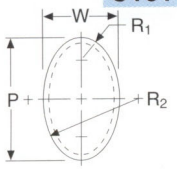
90°

180°

0°

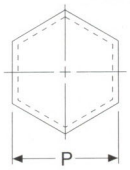
270°

C101

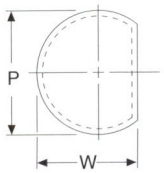


R_1 = .683W - .183P
R_2 = 1.183P - .683W

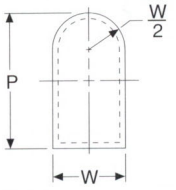
C102



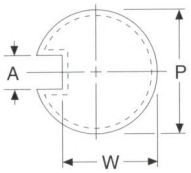
C103



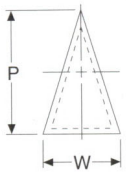
C104



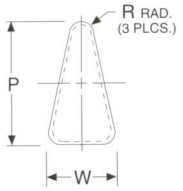
C105



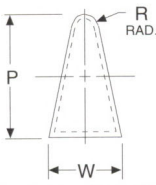
C106



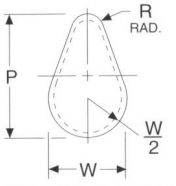
C107



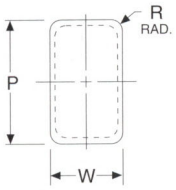
C108



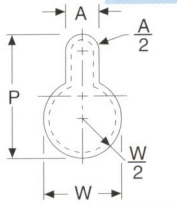
C109



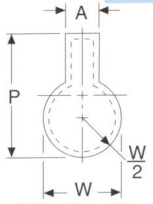
C110



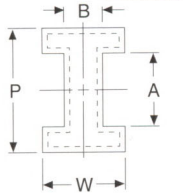
C111



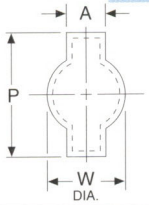
C112



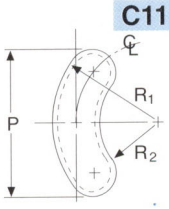
C113



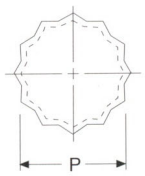
C114



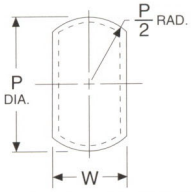
C115



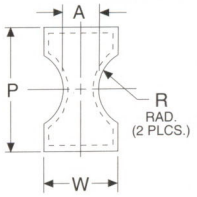
C116



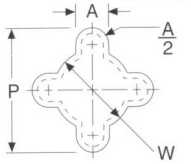
C117



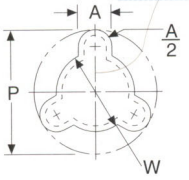
C118



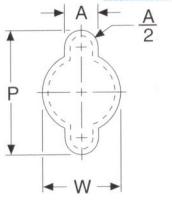
C119



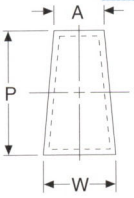
C120



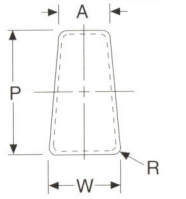
C121



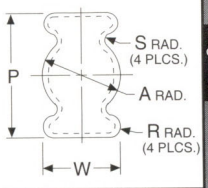
C122



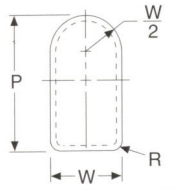
C123



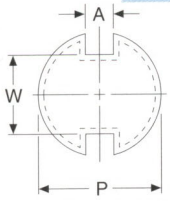
C124



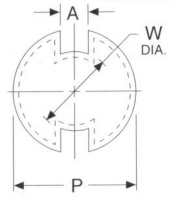
C125



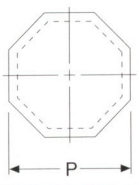
C126



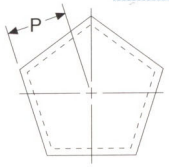
C127



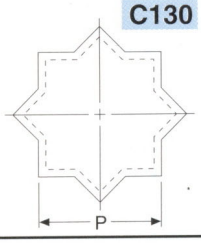
C128



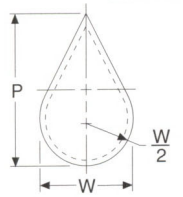
C129



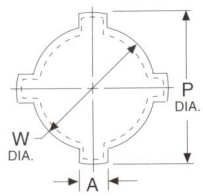
C130



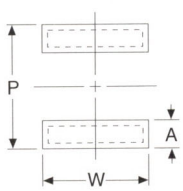
C131



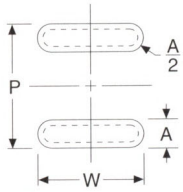
C132



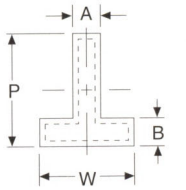
C133



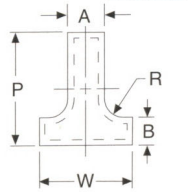
C134



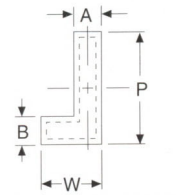
C135



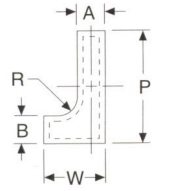
C136



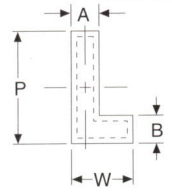
C137



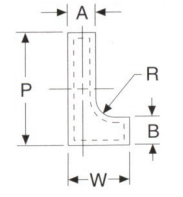
C138



C139



C140



C141

C142

ORDERING EXAMPLE: see page T7.

© 1995 Lane Punch Corporation. All rights reserved.

Ball-Lock Punch Blanks: pages B5, B13, B19, B27
General Punch Shoulder Blanks: pages G5, G12, G24
Peerless Punch Shoulder Blanks: pages PS5, PS6

NOTE:
All views in
Die Position

Ball-Lock Die Button Blank: page B33
General Die Button Blanks: page G29
Peerless Die Button Blanks: page PS9

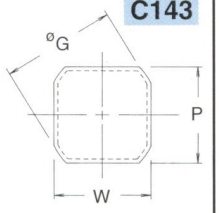
90°

180°

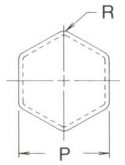
0°

270°

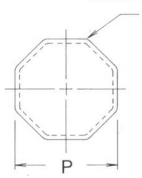
C143



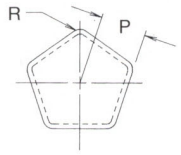
C144



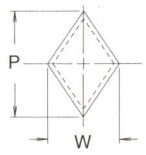
C145



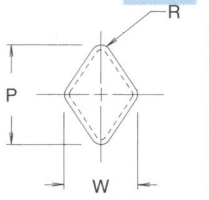
C146



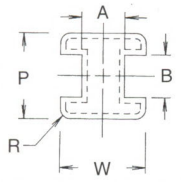
C147



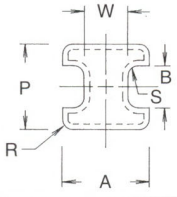
C148



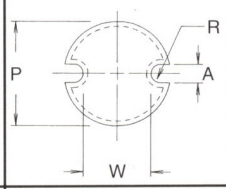
C149



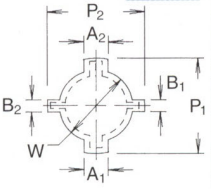
C150



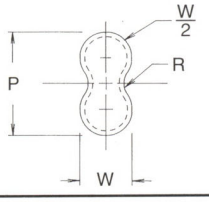
C151



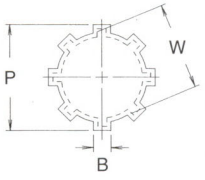
C152



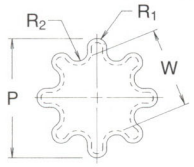
C153



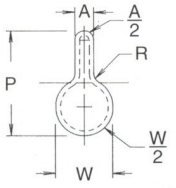
C154



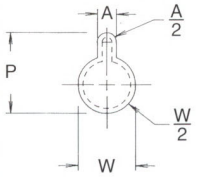
C155



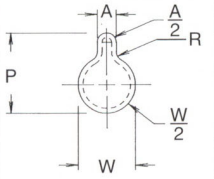
C156



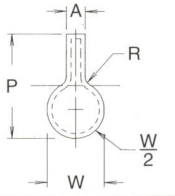
C157



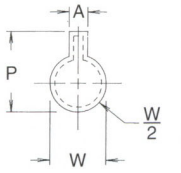
C158



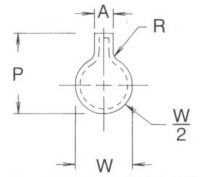
C159



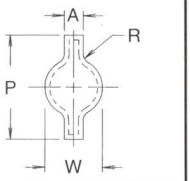
C160



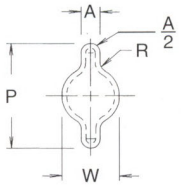
C161



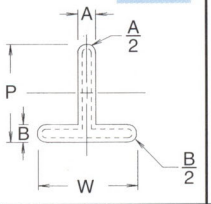
C162



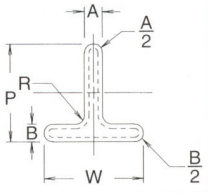
C163



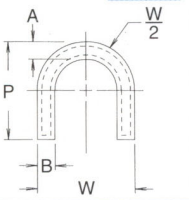
C164



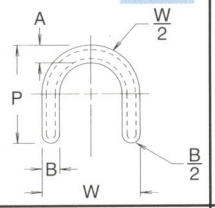
C165



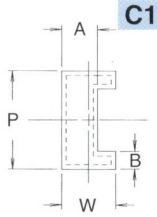
C166



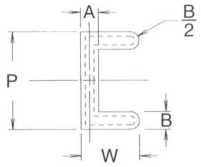
C167



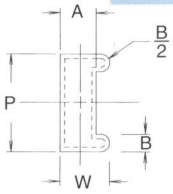
C168



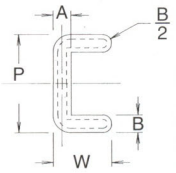
C169



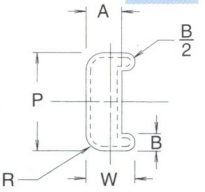
C170



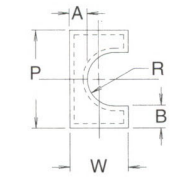
C171



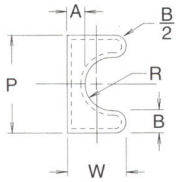
C172



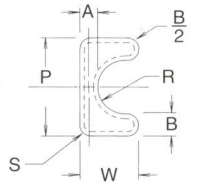
C173



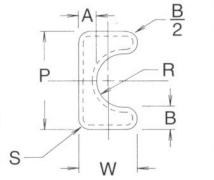
C174



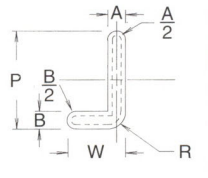
C175



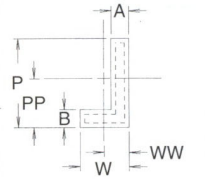
C176



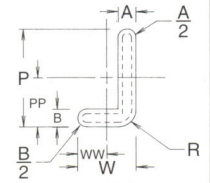
C177



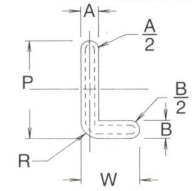
C178



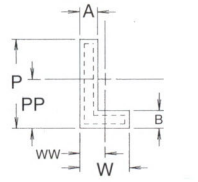
C179



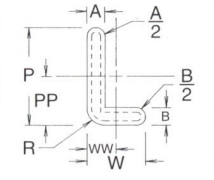
C180



C181



C182



C183

C184

ORDERING EXAMPLE: see page T7.

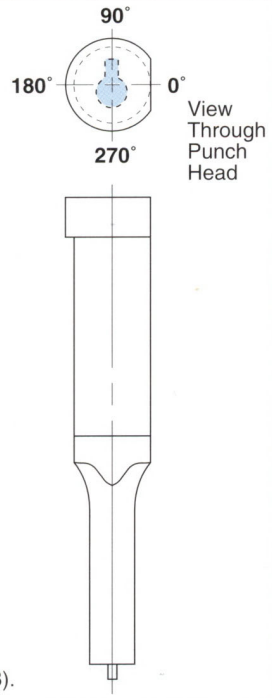
© 1995 Lane Punch Corporation. All rights reserved.

Classifed Shapes: Ordering Examples

Lane Classified Shapes are centered on the shank or body diameters and shown **in die position**. Solid-shaped lines indicate the die button. Dash-shaped lines indicate the punch point. For Punch or Die Button Catalog number, refer to respective catalog pages.

Ball Seat or Key Flat Position must be specified by indicating the angle: 0°, 90°, 180° or 270° (special angles optional). See the *Ordering Examples* or refer to pages T9–T10.

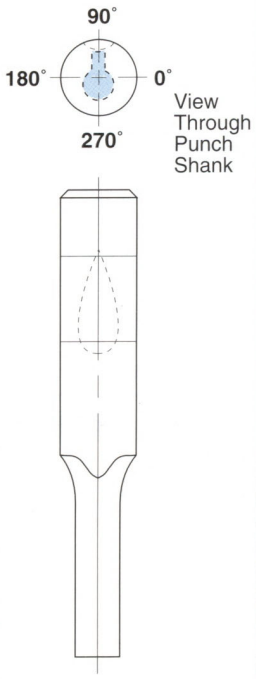
Punch
Ordering Example #1



(1) PESC 10-C63 M2 C112
P7.9 W6.0 A3.0 K2 0°

See page PS6 for available blanks (PESB).

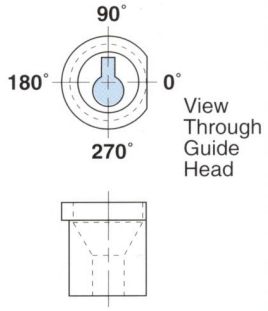
Punch
Ordering Example #2



(1) BPLC 10-13-63 M2 C112
P7.9 W6.0 A3.0 BS-90°

See page B27 for available blanks (BPLB).

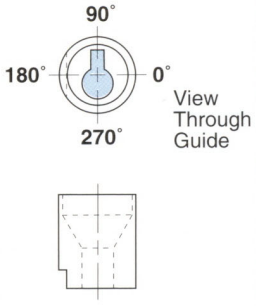
Guide
Ordering Example #3



(1) PGUC 16-16 A2 C112
P7.95 W6.05 A3.05 K2 0°

See page PS11 for available guides (PGUB).

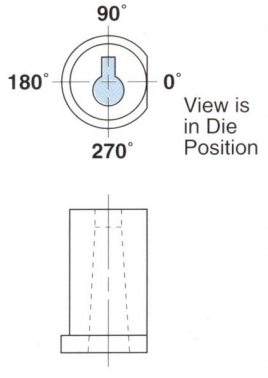
Guide
Ordering Example #4



(1) PGPC 16-16 A2 C112
P7.95 W6.05 A3.05 K2 180°

See page PS10 for available guides (PGPB).

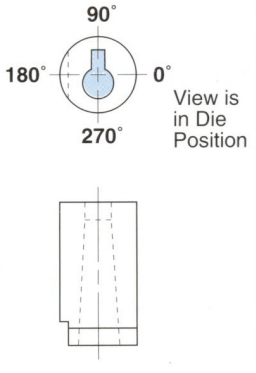
Die Button
Ordering Example #5



(1) PBSC 16-20 A2 C112
P8.0 W6.1 A3.1 K2 0°

See page PS9 for available die button blanks (PBSB).

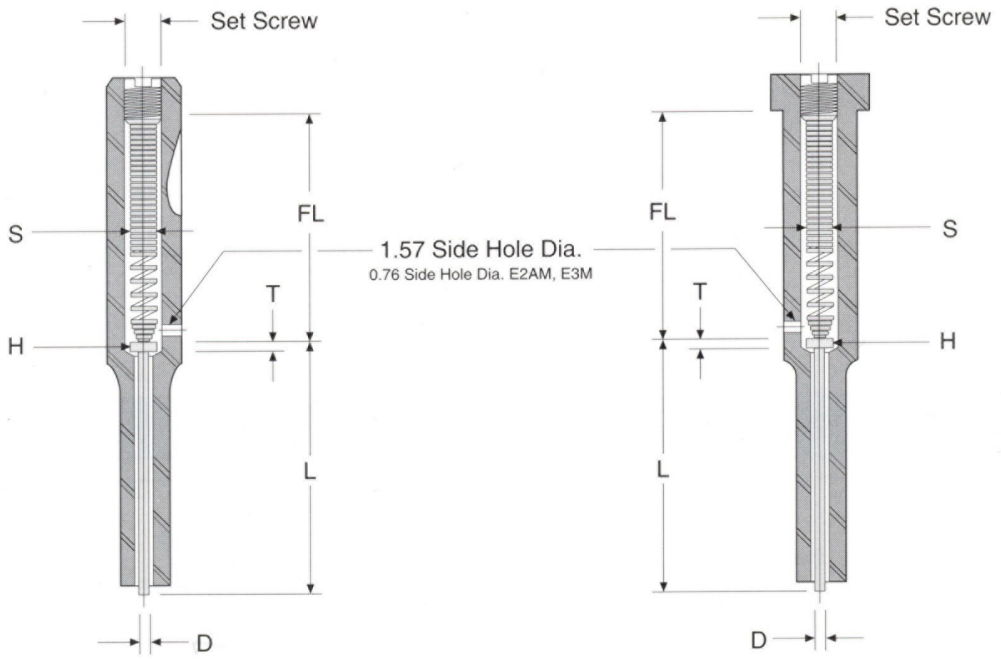
Die Button
Ordering Example #6



(1) GBPC 16-5-20 A2 C112
P8.0 W6.1 A3.1 K2 180°
TAPER RELIEF

See page PS9 for available die button blanks (PBPB).

© 1995 Lane Punch Corporation. All rights reserved.



Ordering Example:
(25) E6M Ejector Kits

EJECTOR CATALOG NUMBER	PIN DIAMETER "D"	PIN OVERALL LENGTH "L"	PIN HEAD THICKNESS "H"	SPRING DIAMETER "S"	SPRING FREE LENGTH "FL"	SET SCREW SIZE	BALL-LOCK PUNCH SHANK DIAMETER	SHOULDER PUNCH SHANK DIAMETER
E2AM	0.51	28.2	1.2	1.95	63.50	M2.5 x .45	6	5
E3M	0.69	35.0	2.0	2.54	63.50	M3 x .5	—	6
E4M	1.04	49.3	2.4	3.35	76.20	M4 x .7	10	8
E6M	1.47	49.3	3.2	4.14	101.60	M5 x .8	13	10 – 13
E9M	2.26	56.4	3.9	5.03	101.60	M6 x 1	16 – 25	16 – 25
E12M	3.00	56.4	4.7	6.60	101.60	M8 x 1	32 and up	32 and up

Pin Extensions = 0.8mm E2AM, E3M
1.5mm E4M, E6M, E9M, E12M

Ejector Components are Sold in ***Sets Only.***

Set includes one each: Pin, Spring & Set Screw.

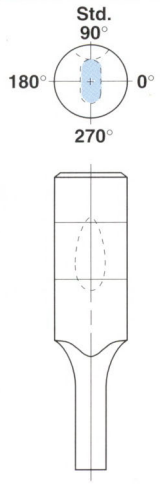
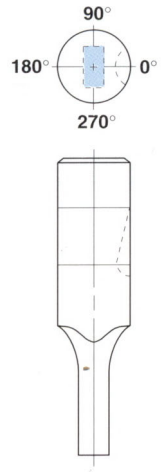
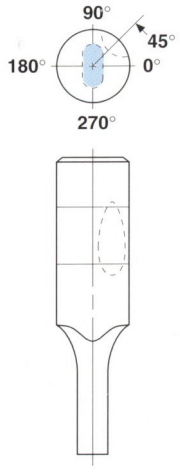
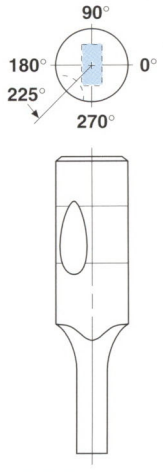
تامین کننده قطعات استاندارد قالب
www.avrinco.com info@avrinco.com
۰۹۱۲۸۴۷۶۵۹۶ ۰۹۱۲۳۸۵۱۰۴۴ تجهیز قالب اورین
instagram: @avrinco_ تلفن: ۰۲۱-۴۴۱۳۳۱۵۱
عاملیت فروش قطعات استاندارد در ایران
AZOL-GAS CODIPRO PUNCH INDUSTRY CO., LTD. Lane ORSA BKM BURSA KALIP MERKEZİ

All key locking devices are shown in die position.

Ball-Lock Standard Key Locations

BS (Ball Seat) - **90°**

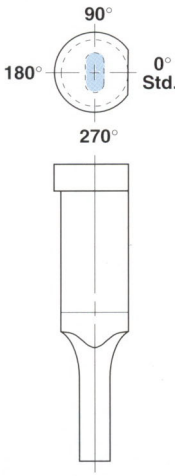
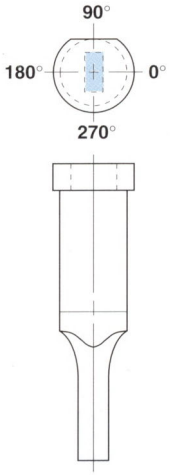
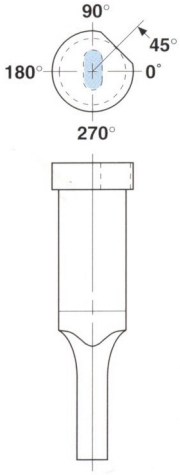
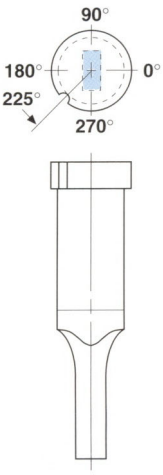
Unless otherwise specified, Standard Location is furnished.

				
Ordering Examples:	BPLO 13-13-63 M2 P10.0 W5.0 BS-90°	BPLS 13-13-63 M2 P10.0 W5.0 BS-0°	BPLO 13-13-63 M2 P10.0 W5.0 BS-45°	BPLS 13-13-63 M2 P10.0 W5.0 BS-225°

General™ Standard Key Locations

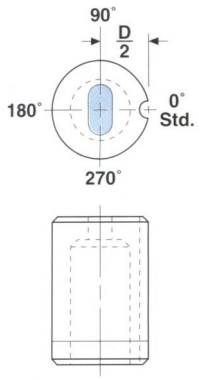
K2 Key Flat @ 0°
K3 Key Flats @ 0° and 180°
K4 Pin Slot @ 0°

Unless otherwise specified, Standard Location is furnished.

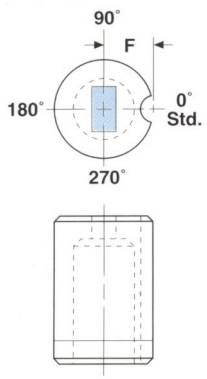
				
Ordering Examples:	GPSO 13-13-63 M2 P10.0 W5.0 K2-0°	GPSS 13-13-63 M2 P10.0 W5.0 K2-90°	GPSO 13-13-63 M2 P10.0 W5.0 K2-45°	GPSS 13-13-63 M2 P10.0 W5.0 K4-225°

Automotive Industry Standards

K0 ⌀3.0 PIN SLOT

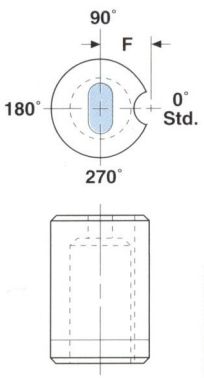


K41 ⌀4.0 PIN SLOT



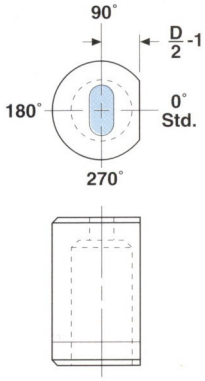
DIA. "D"	"F"
10	6.0
13	7.2
16 & up	D/2

K61 ⌀6.0 PIN SLOT NAAMS STD.

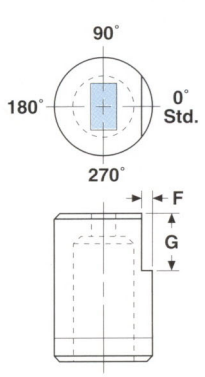


DIA. "D"	"F"
10	7.0
13	8.2
16	9.0
20	11.0
22	12.0
25	13.5
32 & up	D/2

K80 THRU-FLAT



K85 STEPPED KEY FLAT



DIA. "D"	"F"	"G"
10 – 16	1.5	10.0
20 & up	2.0	12.0

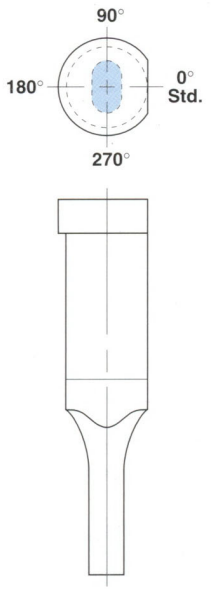
Key Locking Devices

Lane PUNCH CORPORATION

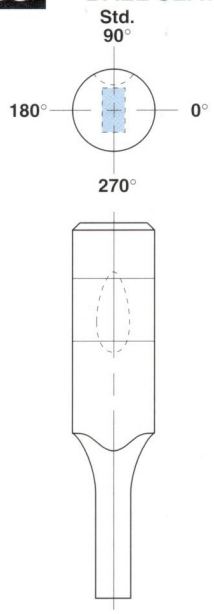
All key locking devices are shown in die position.

PUNCHES

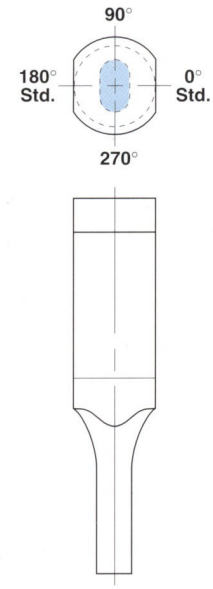
K2 SINGLE FLAT



BS BALL SEAT



K3 DOUBLE FLATS



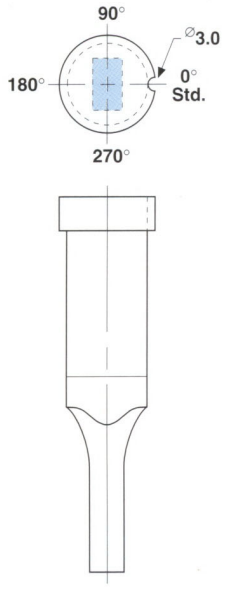
Peerless™ Standard Key Locations

K2 Key Flat @ 0°
K3 @ 0° and 180°
K4 Pin Slot @ 0°

Radial degrees for non-standard locations must be specified at time of order.

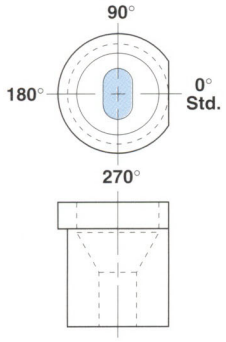
Unless otherwise specified, Standard Location is furnished.

K4 ∅3.0 PIN SLOT

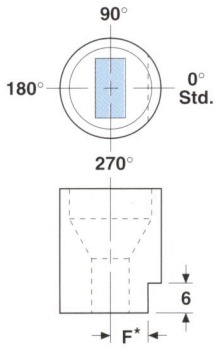


GUIDES

K2 Shown on PGU-Uphead

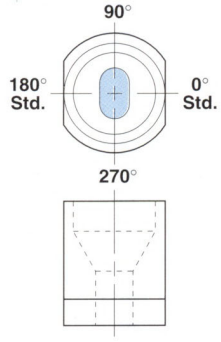


K2 Shown on PGP-Press-fit

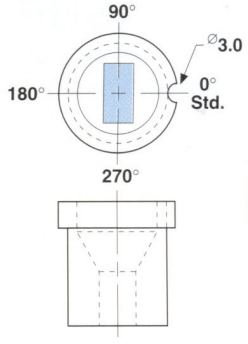


* See table below.

K3 Shown on PGD-Downhead

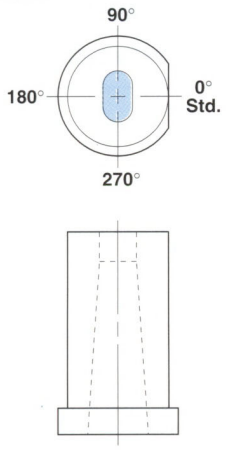


K4 Shown on PGU-Uphead

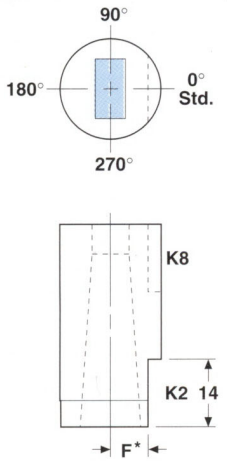


BUTTONS

K2

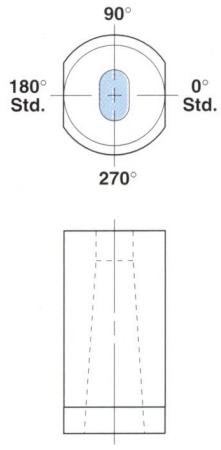


K2

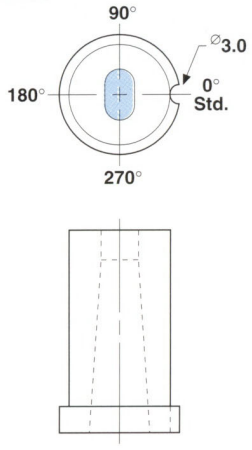


* See table below.

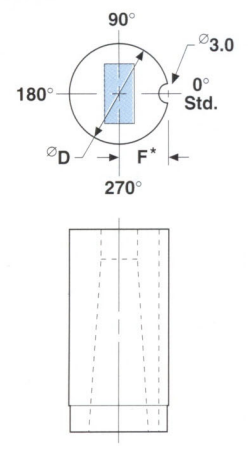
K3



K4 Headed



K4 Headless



If D ≧ 16.0, then F* = .5D
If D < 16.0, then F* = .4D + 1.5

* For Headless Die Buttons & Guide Bushings Only

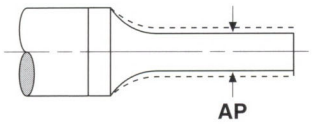
DIA. "D"	5.0	6.0	8.0	10.0	13.0	16.0	20.0	22.0	25.0	32.0	38.0	40.0	45.0	50.0	56.0	63.0	71.0	76.0	85.0	90.0	100.0
*"F" DIM.	2.2	2.6	3.5	4.3	5.6	6.9	8.7	9.5	10.8	13.8	16.5	17.5	19.5	21.7	24.2	27.3	30.7	33.0	37.5	40.0	45.0

Standard Punch Alterations are shown for customer convenience in describing sizes not shown in the catalog.

Standard Alterations are for *stock reduction* to existing standard items.

AP, AW

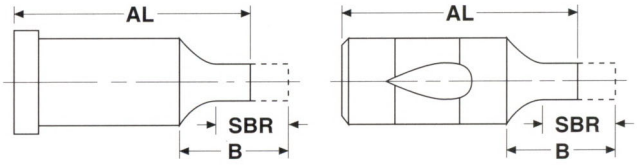
Altered Point "P"
Altered Width "W"



Ordering Example:
(6) PPSS 20-B80 A2 P16.0 AW4.5

AL

Altered Length "L"



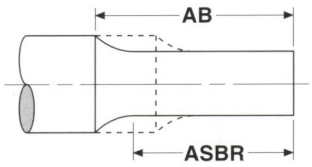
Note: AL *shortens* "B" (point length) & "SBR" (straight before radius).

Note: The recommended practice is to specify **AB** along with **AL** if a shortened "B" ("SBR") is not acceptable.

Ordering Example:
(6) BPHR 13-13-80 M2 P10.0 AL75.5 AB20

AB, ASBR

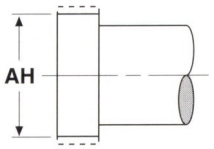
Altered Point Length "B"
Altered Straight Before Radius "SBR"



Ordering Example:
(3) PPSR 10-B63 PS P8.0 AB23.0

AH

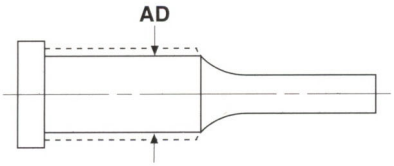
Altered Head Diameter "H"



Ordering Example:
(4) PPSR 16-C80 M2 P15.5 AH19.0

AD

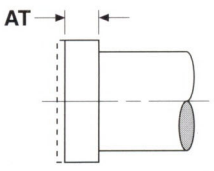
Altered Shank Diameter "D"



Ordering Example:
(4) PPSR 16-C80 P15.5 AD15.84

AT

Altered Head Thickness "T"



Note: AT *shortens* "L" (overall length).

Ordering Example:
(3) PPSR 16-C80 M2 P15.5 AT3.0

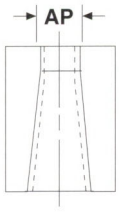
© 1995 Lane Punch Corporation. All rights reserved.

Standard Die Button Alterations are shown for customer convenience in describing sizes not shown in the catalog.

Standard Alterations are for *stock reduction* to existing standard items.

AP, AW

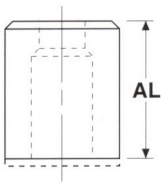
Altered Point "P"
Altered Width "W"



Ordering Example:
(6) PBSO 13-25 A2 P8.1 AW1.20

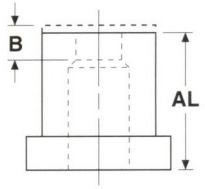
AL for *General* product line.

Altered Length "L"



Headless Press-Fit

Note: Stock is removed from the bottom of the button.



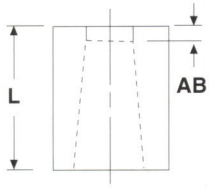
Shoulder

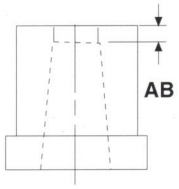
Note: AL *shortens* "B" (land length).

Ordering Example:
(6) GBPO 13-6-25 A2 P6.5 W3.4 AL24.0

AB for *Peerless* product line.

Altered Land "B"





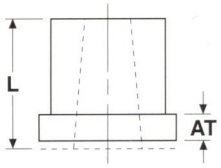
Note: Land length is shortened or lengthened internally per order. **AB** does ***not*** affect "**L**" in either headed or headless style.

Lane discourages altering "B" length in the **General** product line.

Ordering Example:
(3) PBSO 13-25 A2 P8.1 W3.4 AB1.9

AT

Altered Head Thickness "T"

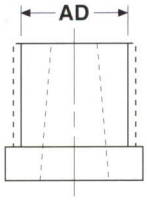


Note: AT *shortens* "L" (overall length).

Ordering Example:
(4) PBSO 13-25 A2 P8.1 W3.4 AT3.0

AD

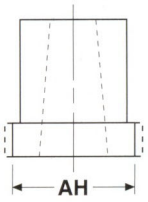
Altered Body Diameter "D"



Ordering Example:
(4) PBSO 13-25 A2 P8.1 W3.4 AD12.65

AH

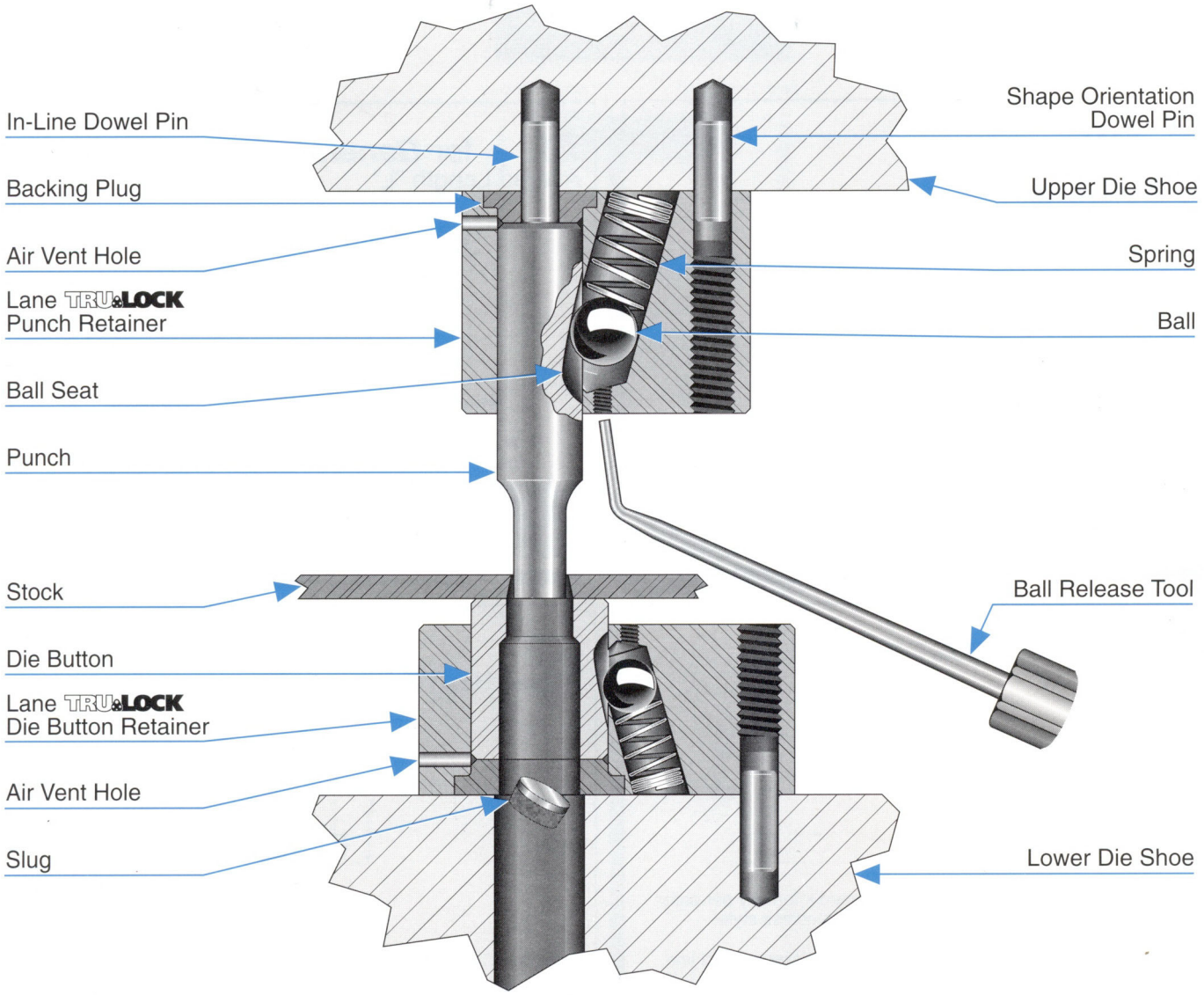
Altered Head Diameter "H"

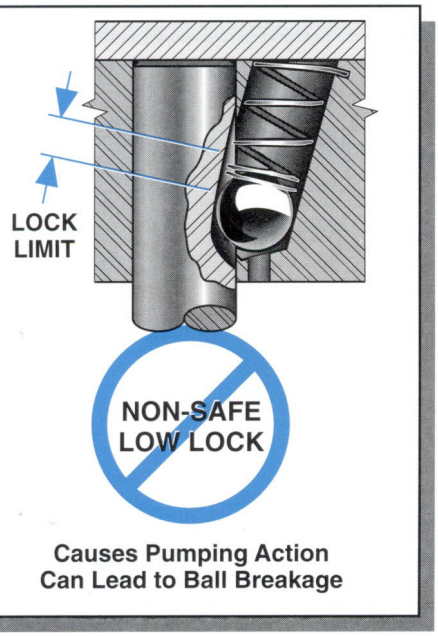


Ordering Example:
(3) PBSO 13-25 A2 P8.1 W3.4 AH15.5

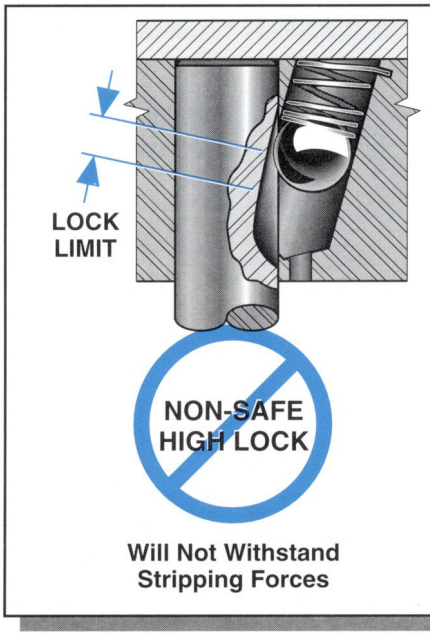
© 1995 Lane Punch Corporation. All rights reserved.

Ball-Lock Terminology

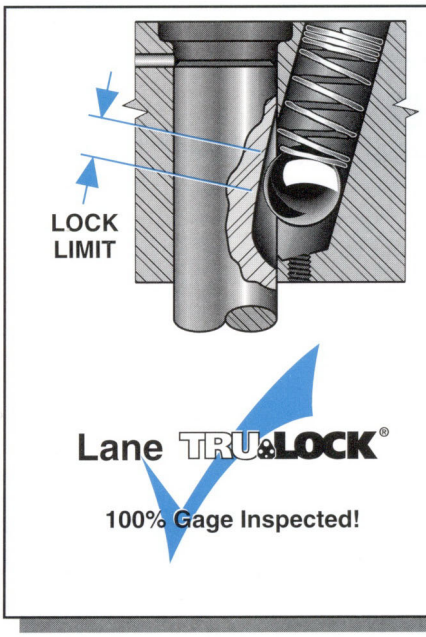




Causes Pumping Action Can Lead to Ball Breakage



Will Not Withstand Stripping Forces



Lane TRU&LOCK®

100% Gage Inspected!

Ball-Lock System of Retention

Lane PUNCH CORPORATION

The Ball-Lock retention system is a unique adaptation of the wedge principle. It assures positive locking, both vertically and radially, and permits rapid replacement of punches or die buttons from the working side of the die assembly.

Component installation is quick and simple: insert the punch or die button into the retainer hole and twist. The ball drops into the ball-seat to provide an immediate and positive lock.

To remove a component, it is only necessary to depress the ball by means of a release tool. This action frees the punch or die button so that it can be pulled out of the retainer.

During punch replacement, it is unnecessary to disassemble the retainer set or to remove the die assembly.

If a spring-loaded stripper plate is utilized, however, removal of "window" inserts or the plate itself may be necessary to clear the punch shanks.

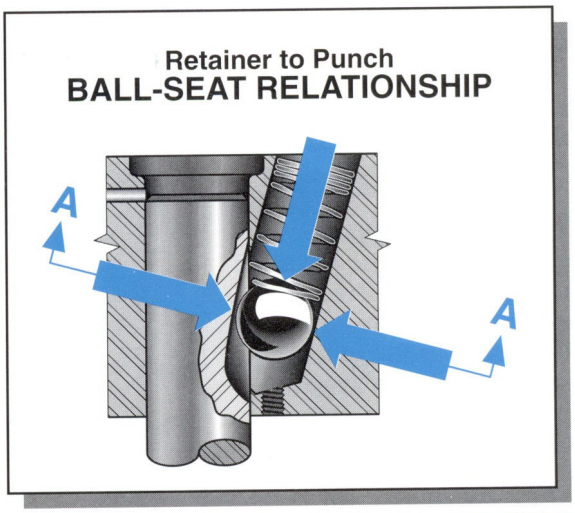
The hardened backing plug distributes the punching load transmitted through the punch over a greater surface area. The reduced stress levels prevent "sinking" of the plug into the punch holder. By virtue of its hardened condition, the backing plug resists sinking of the punch despite the high stress values imposed by the end face of the punch.

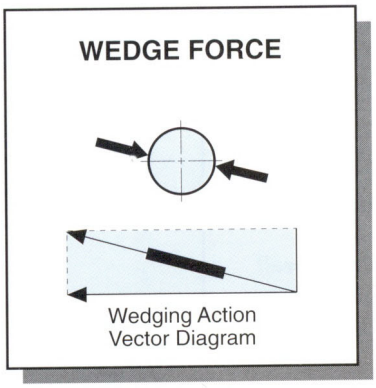
The locking area of the ball-seat must be relieved by means of a diametrical reduction on the punches only. Extremely high stresses are developed as a result of the three-point contact, and the ball-seat edges may become flattened during the punching cycle. The relief provides an area into which these minor deformations can be displaced to eliminate interference during punch removal.

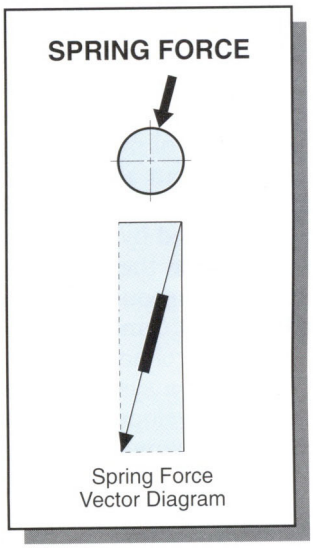
The retainer body contains a perpendicular hole which is a slip-fit with the punch shank or die button body. An angular ball-hole is provided adjacent to and intersecting with the component hole. It is very important to note that the ball-hole has a slightly greater angularity from the vertical than the ball-seat in the component. This angular difference helps to develop a dependable wedging action.

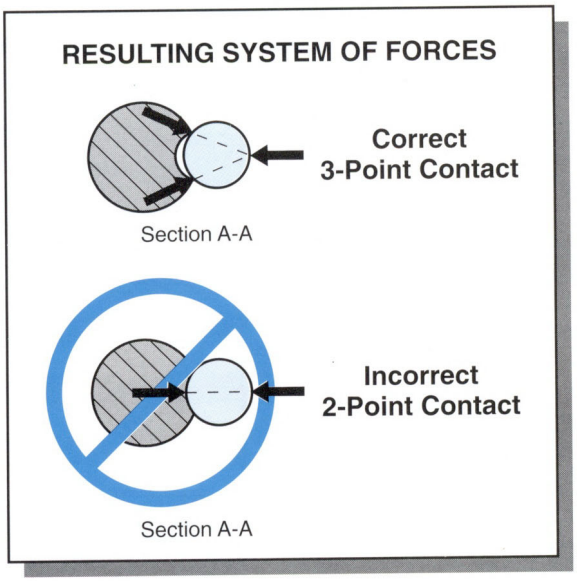
The salient forces and their directions of application are illustrated in the assembly drawing. Vector diagrams are indicated in the satellite sketches to further illustrate the actions and reactions.

A compression spring forces the hardened ball between the punch or die button and the retainer body. The spring load is applied to the ball at the angle established by the ball-hole. Resolution of the spring force into horizontal and vertical components indicates that the ball will move downward and to the left. The horizontal component forces the punch or die button against the retainer hole until all of the slip-fit clearance is adjacent to the ball.









Examination of the assembly will reveal that solid contact has been developed along section line A-A. In effect, the ball is solidly wedged between the ball-hole and the ball-seat while the punch or die button is forced against the retainer hole.

Because the plane of contact is elevated from the horizontal, the vector components indicate the punch is also exposed to an upward force which tends to move it toward the backing plug. It is easily seen that any downward force, such as that imposed by stripping, applied to the punch can only serve to increase the wedging action. Conversely, upward thrust of the component due to application of punching load will be opposed by the backing plug.

NAPM National Association of Punch Manufacturers.

Ball-Lock Gaging

Functional Gaging Assures Interchangeability

The safe locking range is established by the permissible minimum and maximum distances of the ball from the top of the retainer.

Utilization of dimensional limits relative to the ball-seat and the retention portion of the retainer body were once considered basic to the development of component standards. As the proposal activity progressed, it became apparent that a new basis for locking interchangeability was necessary.

First, the angles and other physical dimensions are extremely difficult to measure. Second, the physical data for the ball-seat must be correlated with that of the retainer body to assure safe locking at assembly. Third, several combinations of dimensional limits are possible without affecting interchangeability. To specify the dimensions and tolerances used by any one manufacturer within the standard could well be disadvantageous to the others who used different combinations but still provided interchangeability.

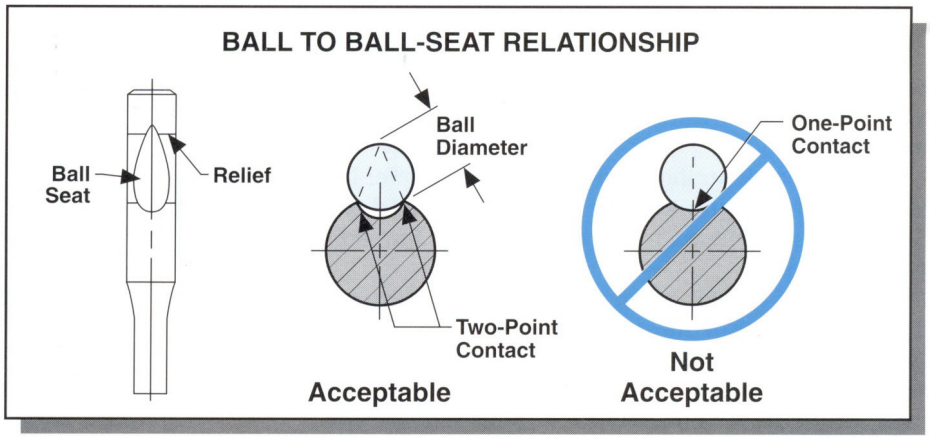
Ultimately, a system of functional gages was developed. It is used by the member companies of the NAPM.*

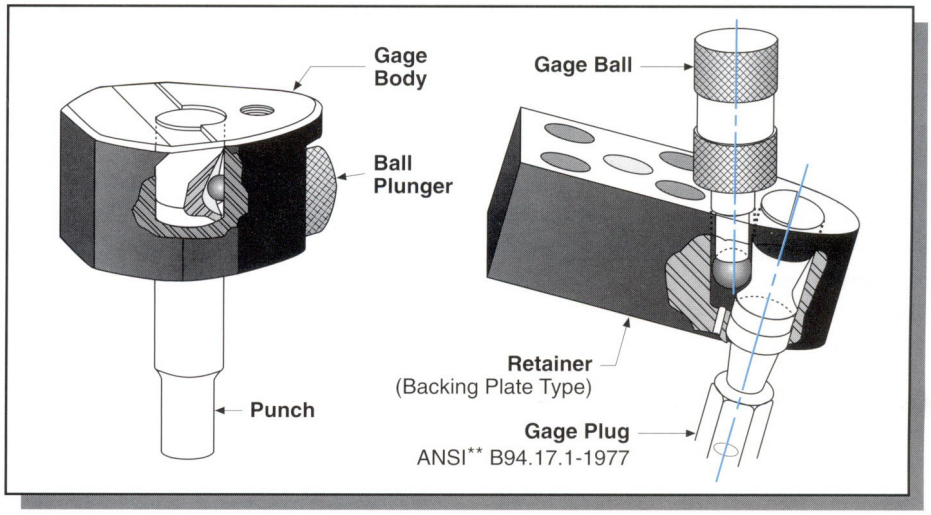
Typical examples of these gages and their application are illustrated.

Ball-lock product standards are classified into two groups: Light Duty and Heavy Duty. Light Duty components are applicable for stock thicknesses up to 3mm. Heavy Duty may be used for materials up to 10mm thick. Extra Heavy Duty is recommended for thicknesses above 10mm.

Because stamped parts are made from many materials having considerable differences in hardness, the aforementioned thicknesses are indications only. Specific applications in critical areas should be discussed with a responsible punch manufacturer, die designer or builder before proceeding with the tooling.

The classifications are based on the diameter of the hardened ball used with a specific shank size. Die buttons, incidentally, are all classified as Light Duty. The charted data should prove helpful in understanding the classification system and also lists the related functional gages.





* **NAPM**: National Association of Punch Manufacturers; ** **ANSI**: American National Standards Institute, Inc.

H

HEAVY DUTY			
Shank, Body or Retainer Hole "D" Dia.	Ball Dia.	Standard Gage No.	
		Punches	Retainers
10	10	HGP-10	HGR-10
13	12	HGP-13	HGR-13
16	12	HGP-16	HGR-16
20	12	HGP-20	HGR-20
25	12	HGP-25	HGR-25
32	12	HGP-32	HGR-32
40	12	HGP-40	HGR-40

L

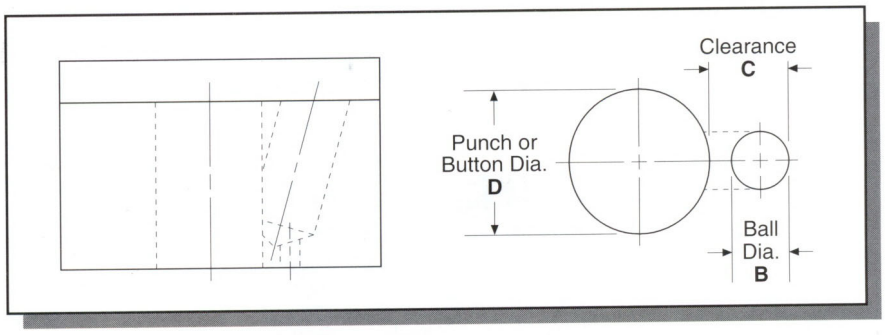
LIGHT DUTY				
Shank, Body or Retainer Hole "D" Dia.	Ball Dia.	Standard Gage Number		
		Punches	Die Buttons	Retainers
6	6	LGP- 6		LGR- 6
10	8	LGP-10		LGR-10
13	8	LGP-13	LGP-13	LGR-13
16	8	LGP-16	LGP-16	LGR-16
20	8	LGP-20	LGP-20	LGR-20
25	8	LGP-25	LGP-25	LGR-25
32	8		LGP-32	LGR-32
38	8		LGP-38	LGR-38

Ball-Lock Retainer Space Requirements

Lane PUNCH CORPORATION

End & Square Retainers: Backing Plate Type

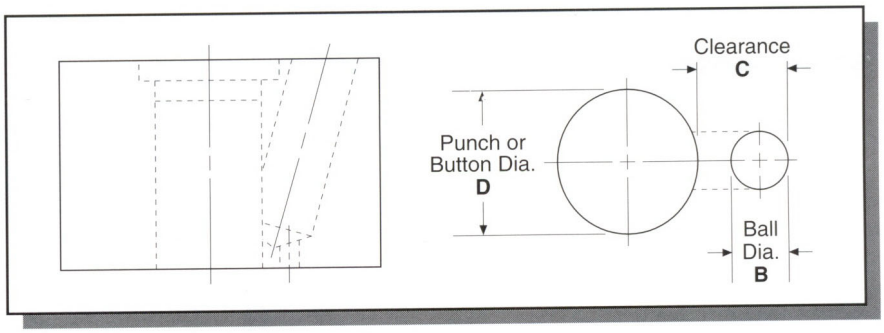
Note: "C" Clearance dimensions are for reference only and are intended for drawing or detailing purposes. Actual Ball Hole locations are derived from ANSI B94.17.1-1977, Gages. See page T15.



LIGHT DUTY PUNCH AND DIE BUTTON For Piercing Stock Up To 3mm			HEAVY DUTY PUNCH For Piercing Stock Up To 6mm			EXTRA-HEAVY DUTY PUNCH For Piercing Stock Over 6mm		
Punch Shank Dia. or Die Button O.D. "D"	Ball Dia. "B"	Clearance "C"	Punch Shank Dia. "D"	Ball Dia. "B"	Clearance "C"	Punch Shank Dia. "D"	Ball Dia. "B"	Clearance "C"
6	6	9						
10	8	11	10	10	13			
13	8	11	13	12	15			
16	8	11	16	12	15			
20	8	11	20	12	15			
25	8	11	25	12	15	25	20	26
32	8	11	32	12	15	32	20	26
38	8	11	40	12	15	40	20	26
						45	20	26
						50	20	26
						56	20	26
						63	20	26

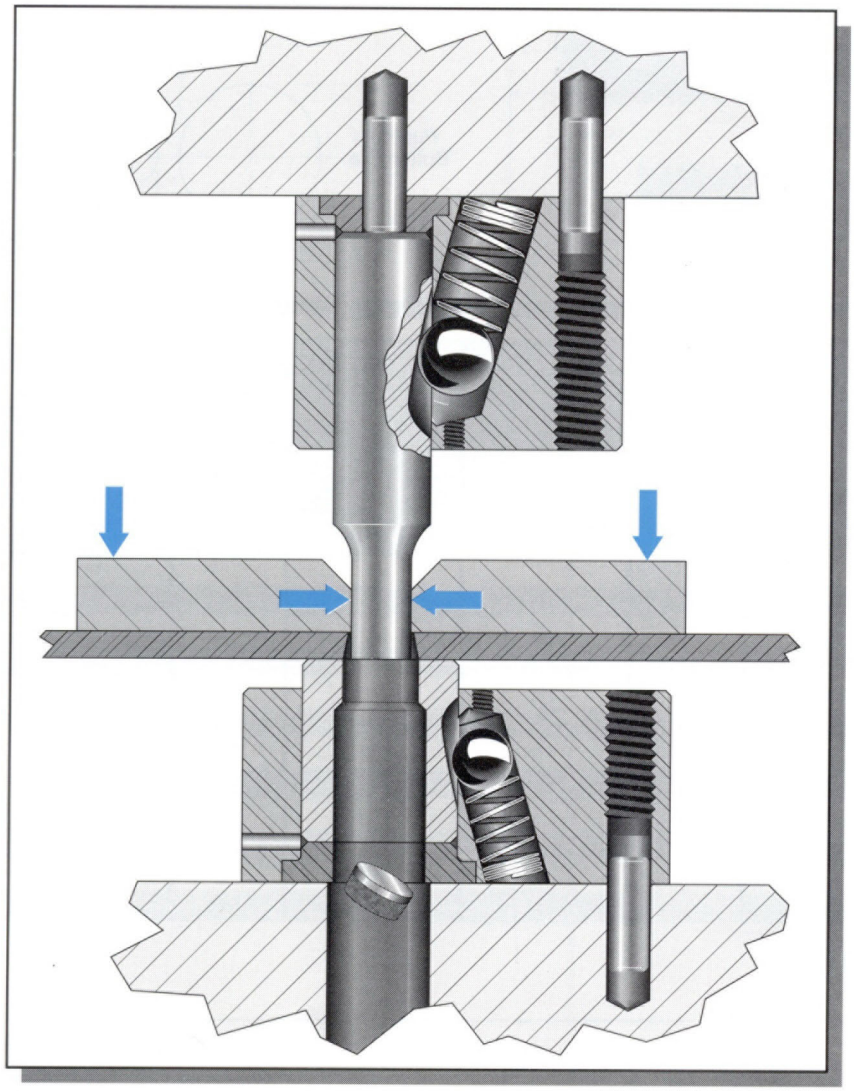
Lane TRU&LOCK® Retainers: Backing Plug Type

See pages SR1 and SR2 in the Standard Retainer section of this catalog.



LIGHT DUTY PUNCH AND DIE BUTTON For Piercing Stock Up To 3mm			HEAVY DUTY PUNCH For Piercing Stock Up To 6mm		
Punch Shank Dia. or Die Button O.D. "D"	Ball Dia. "B"	Clearance "C"	Punch Shank Dia. "D"	Ball Dia. "B"	Clearance "C"
6	6	11			
10	8	13	10	10	15
13	8	13	13	12	17
16	8	13	16	12	17
20	8	13	20	12	17
25	8	13	25	12	17
32	8	13	32	12	17
38	8	13	40	12	17

Ball-Lock Stripping Forces



Stripping Force of Ball-Lock Retainers

Resistances to withdrawal of the punch from the material being punched — the *stripping force* — are calculated against the ultimate yield, i.e. the fracturing cross section of the steel retention ball in the retainer.

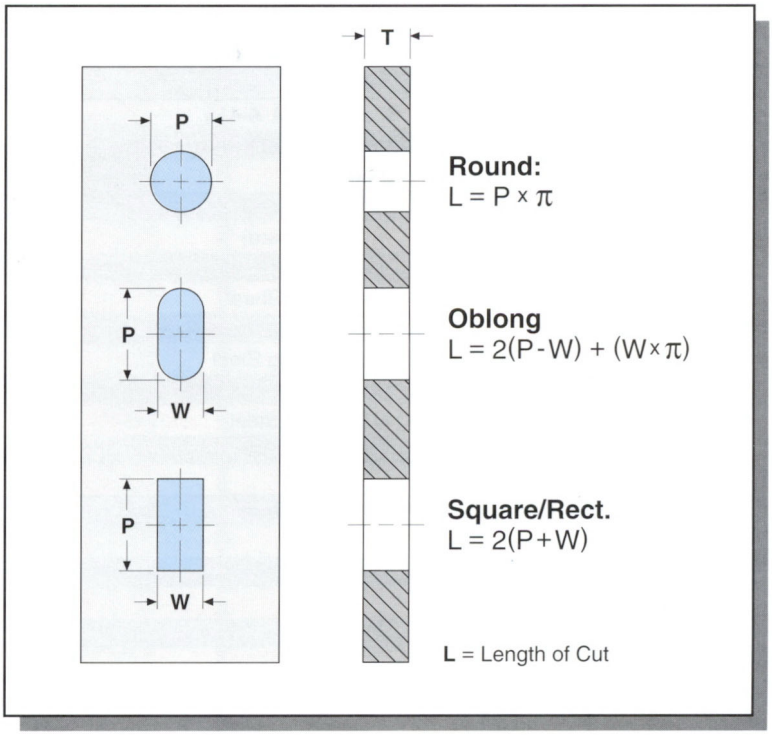
Lane Ball-Lock Retainer Type	Punch Hole ⌀D (mm)	Ball ⌀ (mm)	Stripping Force Resistance (kg)
Lane **Light Duty** Retainers	6	6	453
	10	8	734
	13	8	734
	16	8	734
	20	8	734
	25	8	734
	32	8	734
	38	8	734
Lane **Heavy Duty** Retainers	10	10	1,098
	13	12	1,785
	16	12	1,785
	20	12	1,785
	25	12	1,785
	32	12	1,785
	40	12	1,785
Lane **Extra Heavy Duty** Retainers	25	20	4,008
	32	20	4,008
	40	20	4,008
	45	20	4,008
	50	20	4,008
	56	20	4,008
	63	20	4,008

تامین کننده قطعات استاندارد قالب
www.avrinco.com info@avrinco.com
۰۹۱۲۸۴۷۶۵۹۶ ۰۹۱۲۳۸۵۱۰۴۴ تجهیز قالب اورین
instagram: @avrinco_ تلفن: ۰۲۱-۴۴۱۳۳۱۵۱
عاملیت فروش قطعات استاندارد در ایران
AZOL-GAS CODIPRO PUNCH INDUSTRY CO., LTD. Lane ORSA BKM BURSA KALIP MERKEZİ

Punching Pressure:
(cutting force required)

Formula: **PP = L x T x S***

PP = Punching pressure required in ***Newtons***.
L = Length of cut (perimeter).
T = Thickness of material.
S = Shear strength of material (N).
* See the Shear Strength Chart on page T19.



Stripping Pressure:

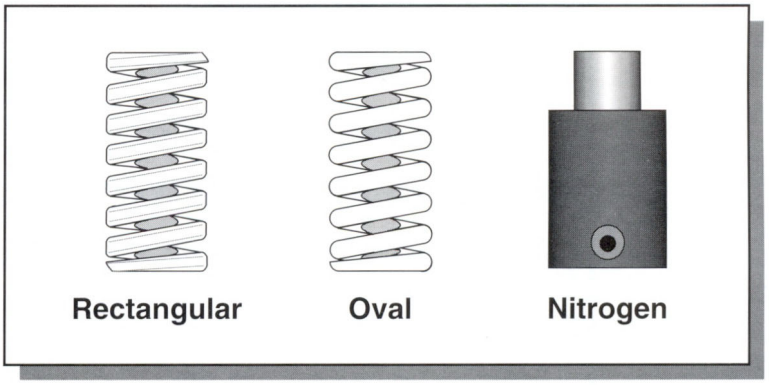
Formula: **SP = L x T x 20.68**

SP = Stripping pressure in Newtons.
L = Length of cut (perimeter).
T = Thickness of material.

Number of Springs Required for Stripping:

Formula: $\mathbf{NS = \frac{SP}{D}}$

NS = Number of springs required.
SP = Stripping Pressure.
D = Deflection of selected spring rating in Newtons, based on spring manufacturer's efficient operating range that meets your needs.



Spring Length & Stripping Pressure

These should be calculated to a point where the working face of the stripper is flush with the cutting edge of the punches, minus the stripper plate's thickness. The force required to punch and the Stripping Pressure can be reduced by *varying* the amount of *clearance* between the Punch & Die.

Phone Lane's Engineers to maximize your production. (NC) 704-633-3900; (MI) 313-397-3200.

Note: Sharpening of punches and die buttons without *shimming* to compensate and/or *lowering the upper press ram adjustment* can lead to:
(a) Increased compression of the spring, premature failure or breakage.
(b) Irregular and inconsistent die performance.
It is always better to use a *higher number* of springs at a *lower force and percentage of travel* for longer life, consistent stock control and stripping.

Strength of Materials

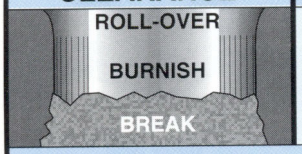
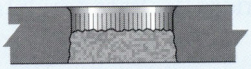
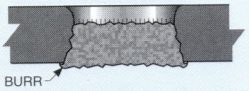
MATERIAL DESCRIPTION		HARDNESS	ULTIMATE	
			Tensile (N/mm²)	Shear (N/mm²)
STEELS	Low Carbon, H.R. Sheet, ASTM A-415	Rb 70	414	356
	Low Carbon, C.R. Sheet, Special Killed, Drawing Quality	Rb 50	356	285
	Low Carbon, C.R. Sheet (Soft)	Rb 45-60	377	299
	(1/4 Hard)	Rb 60-75	414	320
	(1/2 Hard)	Rb 70-85	512	356
	(Hard)	Rb 80-95	655	434
	.40 – .50% Carbon Steel, H.R. Sheet	BHN 200	712	569
	SAE 1074 C.R. Annealed Spring Steel	Rb 90	676	534
	SAE 1095 C.R. Annealed Spring Steel	Rb 95	712	569
	SAE 1074 or 1095 Spring Steel, Hardened to Spring Temper	Rc 45-50	1,850	1,423
	Abrasion-Resisting H.R. Sheet Steel	BHN 200/245	854	712
	Cor-Ten Steel	BHN 140	498	391
	Tri-Ten Steel	BHN 120	414	356
STAINLESS STEELS	T-1 Steel (Types A & B), 712 N/mm²	BHN 260	925	747
	202–Annealed	Rb 95	783	641
	302, 303, 304–Annealed	Rb 85	676	534
	310–Annealed	Rb 90	747	641
	316, 321, 430–Annealed	Rb90	676	534
	410–Annealed	Rb 85	605	534
ALUMINUM BASE ALLOY-TEMPER (500 Kg Load; 10mm Ball)	1100–0	BHN 23	93	64
	–H14	BHN 32	128	78
	2024–0	BHN 47	192	128
	–T3	BHN 120	498	292
	3003–0	BHN 28	114	78
	–H14	BHN 40	157	100
	–H16	BHN 47	185	107
	3105–H25	BHN 47	185	114
	5005–H34	BHN 41	164	100
	5052–0	BHN 47	199	128
	–H32	BHN 60	235	142
	6061–0	BHN 30	128	85
	–T6	BHN 95	320	214
	7075–0	BHN 60	235	157
	–T6	BHN 150	591	342
COPPER BASE ALLOY-TEMPER Copper Dev. Assoc. No.	110–Electrolytic Tough, Pitch Copper–.050mm G.S.	Rf 40	228	157
	–1/2 Hard	Rb 40	299	185
	–Hard	Rb 50	356	199
	220 Comm. Bronze, 90%–1/2 Hard	Rb 58	370	249
	230 Red Brass, 85%–1/4 Hard	Rb 55	356	249
	260 Cartridge Brass, 70%–.035mm G.S.	Rf 68	349	242
	–1/2 Hard	Rb 70	441	285
	–Spring	Rb 91	669	342
	280 Muntz Metal–1/8 Hard	Rb 55	414	299
	342-A High Leaded Brass–1/2 Hard	Rb 70	434	285
	675 Manganese Bronze, A–Soft Anneal	Rb 65	463	299
MISC. METALIC MATERIALS	Gold–14 Carat. Soft		413	299
	Lead		36	25
	Silver, Sterling–Soft		263	192
	–1/2 Hard		463	320
	Tin–Block		36	28
	Zinc–Drawing		142	114
	Titanium–Unalloyed	Rc 23-29	414 – 783	356 – 414
	Magnesium–AZ31B-F (Extruded)	BHN 46-49	256 – 270	135
	Platinum (Annealed)	DPH 40	199 – 214	135 – 149

Punch-to-Die Clearances

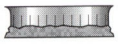
Lane PUNCH CORPORATION

More Ways to Reduce Die Maintenance & Increase Production —

Developing the Best Hole for Your Application:

HOLE CHARACTERISTICS THAT VARY WITH CLEARANCE	EXTREMELY TIGHT CLEARANCE	NORMAL TIGHT CLEARANCE	RECOMMENDED EJECTOR CLEARANCE (Optimum)	LOOSE EJECTOR CLEARANCE (Longest Tool Life)
				
Recommended ***Total Clearance*** Expressed as Percent of Material Thickness.				
Aluminum, Soft	1 – 2%	10 – 12%	18 – 20%	25 – 28%
Aluminum, Hard	1 – 2%	4 – 8%	12 – 15%	16 – 20%
Brass, 1/2 Hard	1 – 2%	6 – 10%	12 – 16%	18 – 22%
Brass, Annealed	1 – 3%	4 – 6%	12 – 16%	16 – 20%
Bronze, Comm. 1/2 Hard	3 – 5%	7 – 10%	20 – 24%	25 – 27%
Copper, 1/2 Hard	2 – 4%	6 – 10%	12 – 16%	18 – 22%
Copper, Annealed	1 – 2%	4 – 8%	10 – 14%	16 – 18%
Lead	3 – 5%	8 – 12%	13 – 15%	16 – 20%
Magnesium	1 – 2%	3 – 6%	7 – 9%	10 – 14%
Stainless, Annealed	2 – 4%	6 – 10%	18 – 22%	25 – 27%
Steel, Low Carbon	2 – 4%	10 – 14%	16 – 20%	15 – 23%
Steel, High Carbon	5 – 10%	22 – 25%	26 – 32%	33 – 36%

GUIDELINES to reducing downtime & increasing production in your dies:

1. The ***function of the hole*** is the most important consideration. 

2. *If the hole is for* ***clearance only***, you can greatly increase punch and die life by adding maximum clearance between the punch and die. Fortunately for most metal stampers, most holes provide clearance for fasteners. These are economical holes to manufacture. 

3. *If your hole has critical specifications for a* ***long, straight sidewall*** (burnish), you will need to develop the proper clearance starting with a *tight* clearance. At this point, you can *vary* the length of straight wall. Lengthen the straight sidewall by *further reducing* the clearance between punch and die. These are very expensive holes to manufacture! 

4. Don't apply rules for #3 to #2. It's very common and very expensive!

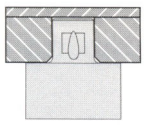
5. ***Alignment*** *of punch to die is essential*, especially for lighter gauge materials, since it will vary the clearance by the amount of misalignment. The problems won't go away until the misalignment is corrected.

6. Much can be accomplished to improve die performance ***before excessive burr*** becomes a factor.

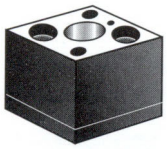
For additional technical application assistance, contact your Regional Manager or Lane's Engineering Dept.

Recommended Design Practices:
Special Ball-Lock Punches & Press-Fit Die Buttons

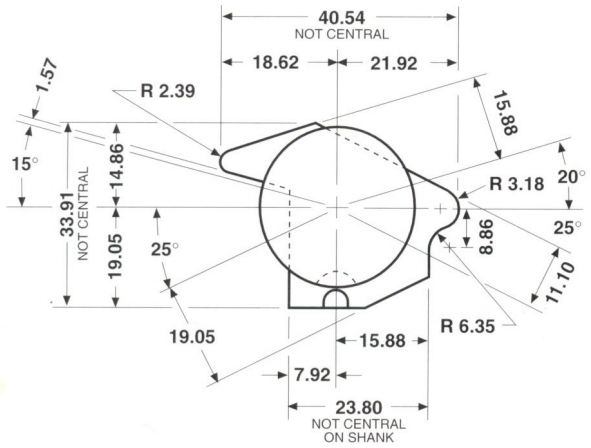
1. Large cut shapes are easily accomplished using *point-larger-than-shank* Lane Ball-Lock construction.
2. To avoid mistakes, Lane recommends special shaped punches be detailed in *die-position.* (See examples shown below).
3. For maximum wear and rigidity, specify the *Lane Bottoming Punch* illustrated in Ball-Lock Section.
4. To handle severe stripping forces, we suggest multiple ball seats or the use of heavy duty or extra-heavy duty retainers as listed in Standard Retainer Section.
5. For Design Assistance Call: 704-633-3900 or 313-397-3200.
   For Fax Assistance or Quotation: (NC) 704-633-2488 or (MI) 313-253-6731.

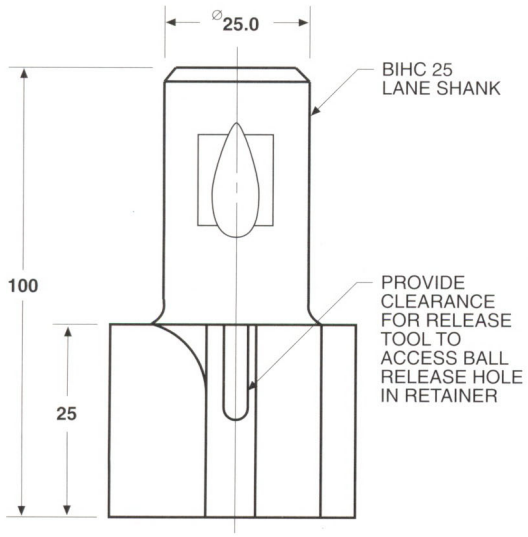


Z-Bottoming Punch
page B30



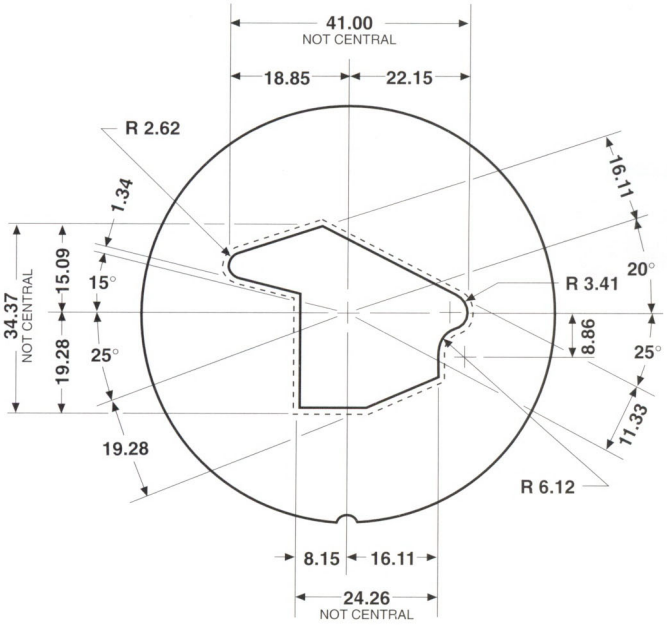
BRES™
page SR8

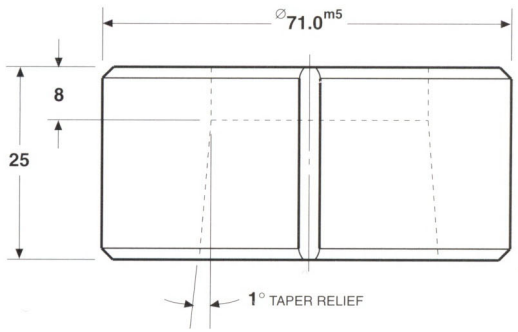




EXAMPLE:

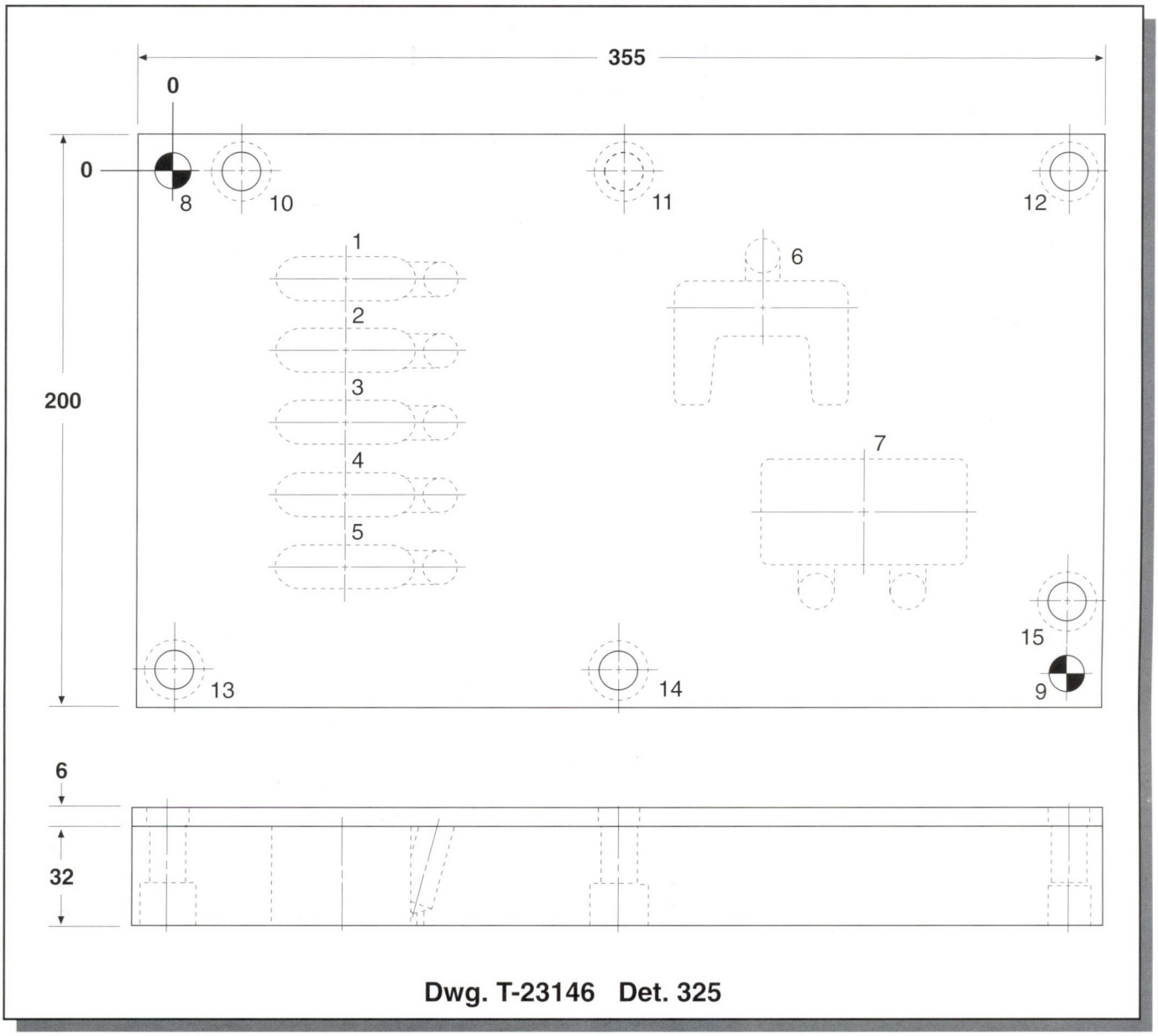
DETAIL # 36 **BIHC 25-25-100 M2**
Special per detail #36.





EXAMPLE:

DETAIL # 47 **GBPC 71-8-25 A2 K4**
Special per detail #47.



Dwg. T-23146 Det. 325

Convenient for Wire EDM Blade Punches.

Punches can be released through the stripper without pulling the die from the press.

Contact Lane's engineers for your special applications.

Ordering Example:
(1) SPECIAL LANE BALL-LOCK RETAINER PER DWG. T-23146, DET. 325

HOLE NO.	X	Y	SIZE	TYPE
1	63.50	38.10	OBLONG 13.0 x 50.0	H.D.
2	63.50	63.50	"	H.D.
3	63.50	88.90	"	H.D.

Punch Wear? Punch Breakage?

Both Cause ***Downtime*** and ***Increase Cost-Per-Stamping***....YOUR BOTTOM LINE!

The following are guidelines toward the proper selection of steel. One must always be aware that, although you may be satisfied with the number of hits from your dies, you should experiment to achieve the maximum production achievable. Lane engineers are available to discuss your problems.

A2, 5% Chrome Rc 59-61

- A good general purpose selection.
- Will resist breakage in many applications where more expensive steels will fracture.
- If your problem is high wear, A2 should not be your choice.
- Under very severe applications, A2 punches tend to shorten in overall length, and point dimensions will swell in diameter just below the blend radius. Avoid a 1:1 ratio of point diameter to metal thickness when using A2.

M2, High Speed Steel Rc 61-63

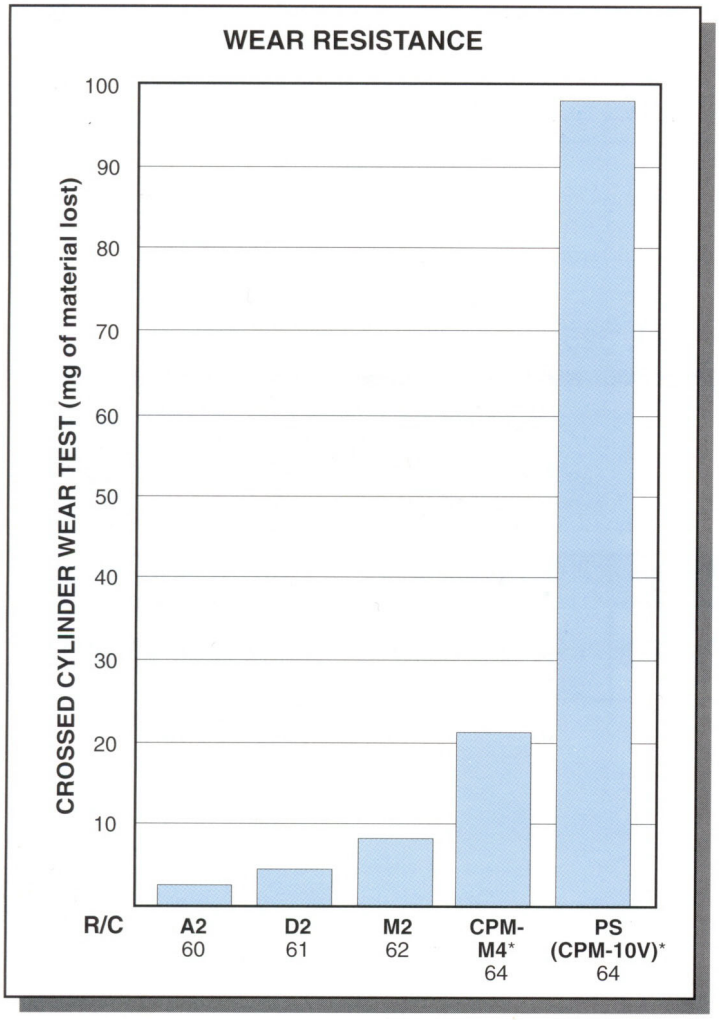
- An economy approach to wear resistance.
- Will outwear A2 steel by 2 to 10 times depending upon the application.
- If your problem is breakage or your application involves severe shock, M2 should not be your choice.

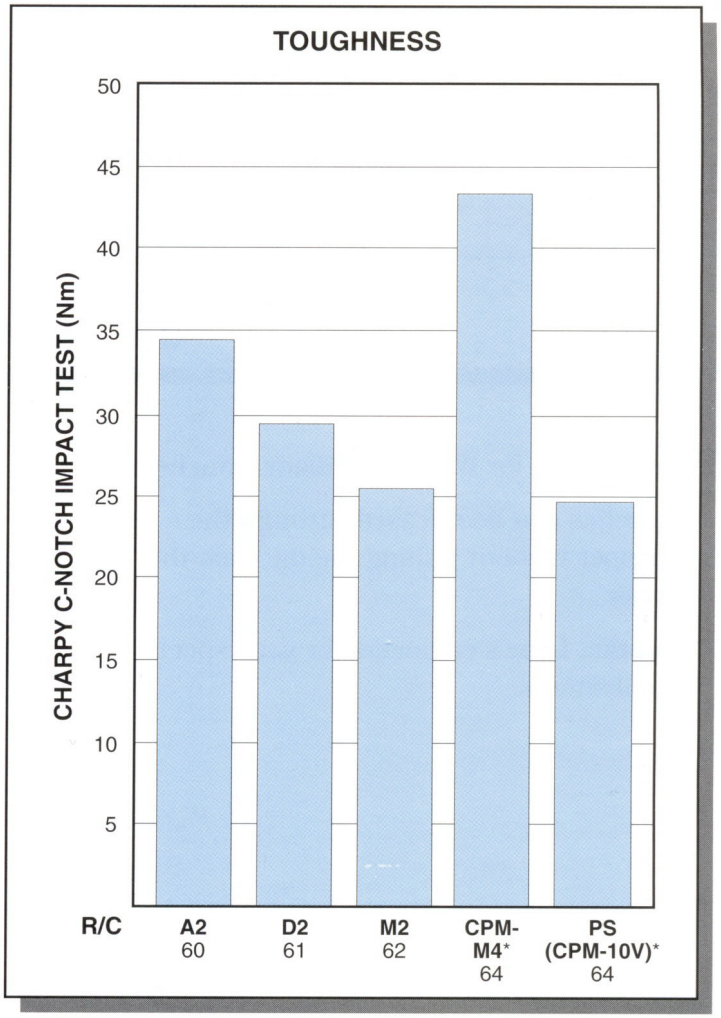
PS, Particle Steel Rc 62-64

- An engineered approach toward maximum wear and abrasion resistance (but not recommended for severe shock applications).
- Known to outwear M2 steel in routine stamping applications from three to ten times!

In today's World Market, Metal Stamping Manufacturers and Die Builders must *not* be satisfied with yesterday's production figures today! Only by integrating *state-of-the-art* technology into your dies can you *remain competitive* and *cost-efficient tomorrow*.

Note: If your application involves high shock or severe breakage, Lane will provide technical assistance to help improve your die perforance.



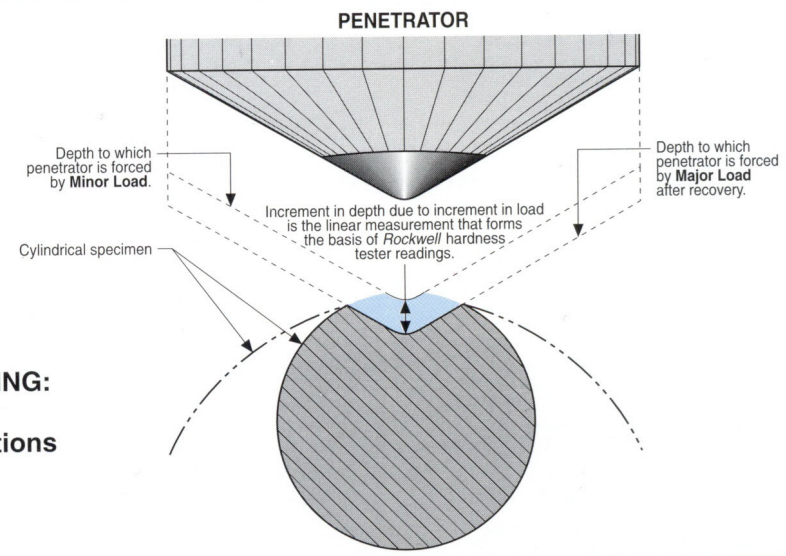


* CPM-M4 and CPM-10V are registered trademarks of Crucible Materials Corp.



ROCKWELL HARDNESS TESTING:

Cylindrical Corrections



Corrections When Testing Cylindrical Surfaces

The Rockwell test is a measure of the resistance of the material being tested to permanent indentation. **There is less lateral support to the penetrating force on a *convex* surface than on a *flat* surface.** Consequently, the penetrator will sink further into the material with the result that the Rockwell hardness number *will be lower on the convex surface* than on a flat piece of the same material. *For a concave surface (or ID)* the opposite is true.

For diameters of 25 mm and smaller the ef fect of the curvature must be taken into consideration. Approximate "Cylindrical Correction Values" will be found in the chart. The cylindrical corrections are added to the dial gauge or digital display reading when testing on the OD (convex surface) and subtracted when testing on the ID (concave surface). On diameters down to 6 mm the regular Rockwell scales can be used; the superficial scales can be used to 3 mm. Below 3 mm cylindrical corrections are not available, nor is Rockwell testing normally recommended. The Knoop hardness is preferred on diameters under 3 mm.

CYLINDRICAL CORRECTION VALUES

Cylindrical work corrections to be added to observed Rockwell Number.

Scales C, D, and A, *Brale* Diamond Indenter

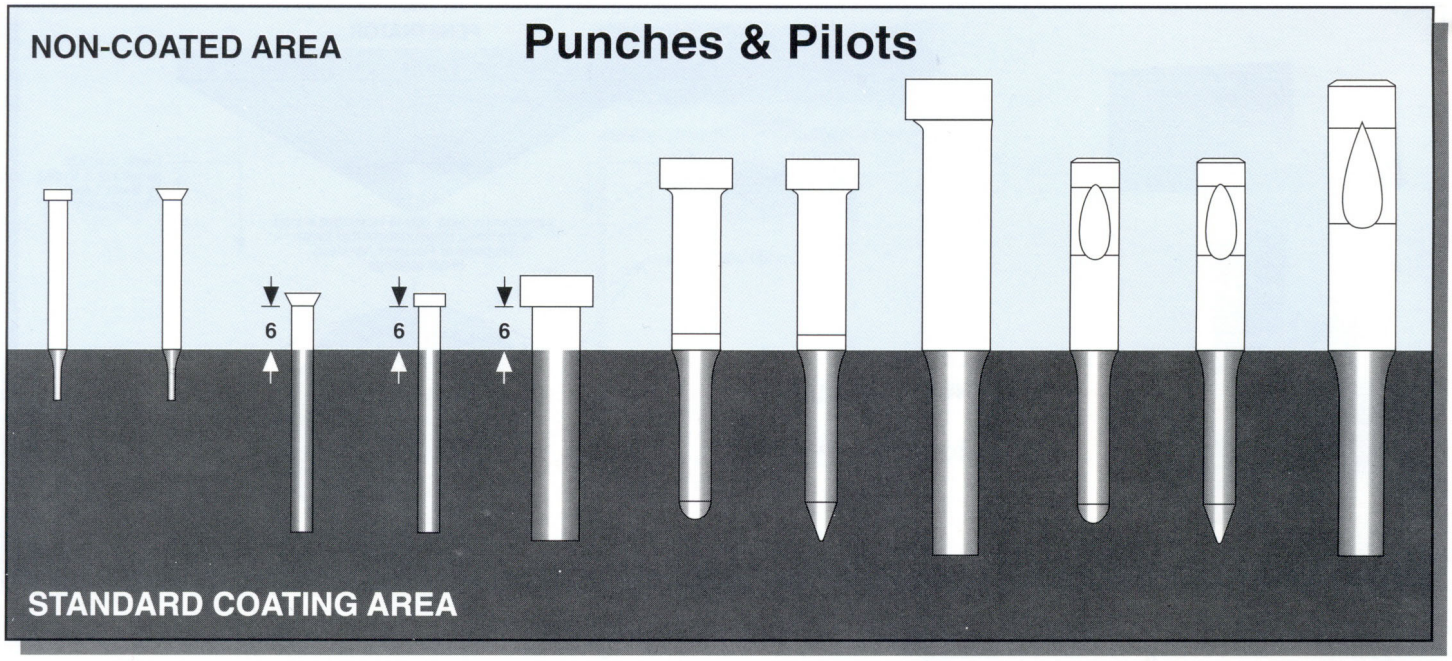
DIAMETER OF SPECIMEN (MM)

Observed Reading	3	6	10	13	16	19	22	25	32	38
90	NA	0.5	0	0	0	0	0	0	0	0
85	—	0.5	0.5	0.5	0	0	0	0	0	0
80	—	0.5	0.5	0.5	0.5	0.5	0	0	0	0
75	—	1.0	0.5	0.5	0.5	0.5	0.5	0	0	0
70	—	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0	0
65	—	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0	0
60	—	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0	0
55	—	2.0	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0
50	—	2.5	2.0	1.5	1.0	1.0	0.5	0.5	0.5	0.5
45	—	3.0	2.0	1.5	1.0	1.0	1.0	0.5	0.5	0.5
40	—	3.5	2.5	2.0	1.5	1.0	1.0	1.0	0.5	0.5
35	—	4.0	3.0	2.0	1.5	1.5	1.0	1.0	0.5	0.5

Excerpts from "Fundamentals of Rockwell Hardness Testing" courtesy Wilson Instruments, Division of Instron Corporation.

HARDNESS CONVERSION CHART

C *150 kg Brale*	A *60 kg Brale*	D *100 kg Brale*	15-N *15 kg N Brale*	30-N *30 kg N Brale*	45-N *45 kg N Brale*	HV *Vickers 10 kg*	HK *500 gm & over*	HB *3000 kg 10mm ball*	WMN *1000 gm*
Rockwell	Rockwell	Rockwell	Superficial	Superficial	Superficial	Vickers	Knoop	Brinell	Microficial
70	86.5	78.5	94.0	86.0	77.5	1076	972	—	953
69	86.0	78.0	93.5	85.0	76.5	1004	946	—	949
68	85.6	76.9	93.2	84.4	75.4	940	920	—	945
67	85.0	76.1	92.9	83.6	74.2	900	895	—	942
66	84.5	75.4	92.5	82.8	73.3	865	870	—	938
65	83.9	74.5	92.2	81.9	72.0	832	846	739	934
64	83.4	73.8	91.8	81.1	71.0	800	822	722	930
63	82.8	73.0	91.4	80.1	69.9	772	799	706	926
62	82.3	72.2	91.1	79.3	68.8	746	776	688	922
61	81.8	71.5	90.7	78.4	67.7	720	754	670	917
60	81.2	70.7	90.2	77.5	66.6	697	732	654	913
59	80.7	69.9	89.8	76.6	65.5	674	710	634	909
58	80.1	69.2	89.3	75.7	64.3	653	690	615	904
57	79.6	68.5	88.9	74.8	63.2	633	670	595	900
56	79.0	67.7	88.3	73.9	62.0	613	650	577	896
55	78.5	66.9	87.9	73.0	60.9	595	630	560	891
54	78.0	66.1	87.4	72.0	59.8	577	612	543	887
53	77.4	65.4	86.9	71.2	58.6	560	594	525	883
52	76.8	64.6	86.4	70.2	57.4	544	576	512	879
51	76.3	63.8	85.9	69.4	56.1	528	558	496	874
50	75.9	63.1	85.5	68.5	55.0	513	542	481	870
49	75.2	62.1	85.0	67.6	53.8	498	526	469	865
48	74.7	61.4	84.5	66.7	52.5	484	510	455	861
47	74.1	60.8	83.9	65.8	51.4	471	495	443	856
46	73.6	60.0	83.5	64.8	50.3	458	480	432	851
45	73.1	59.2	83.0	64.0	49.0	446	466	421	847



Punch and Pilot "P" dimension shown is automatically engineered by Lane Punch to compensate for build-up of coating to meet customer specified dimensions & tolerances.

Punch Ordering Example:
(6) BPHS 25-25-100 M2 P16.0 W10.0 BS90° GP

Is Coating For You?

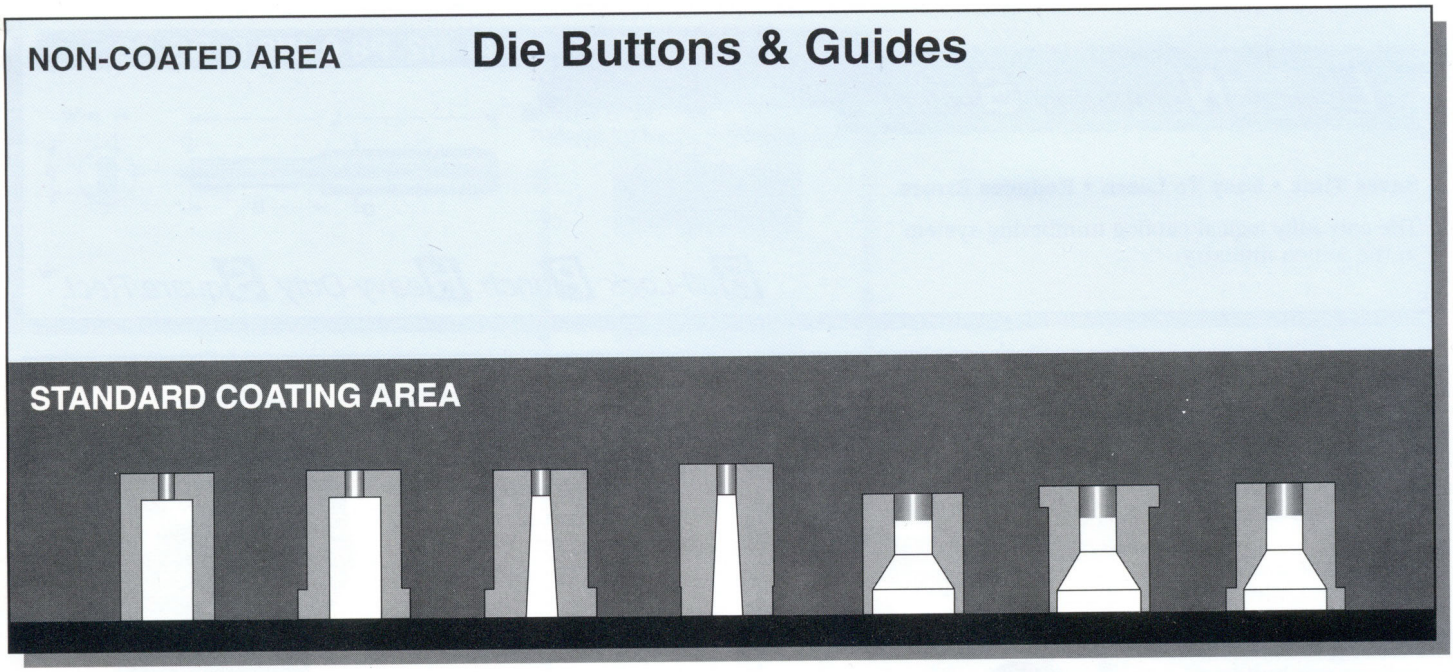
Perhaps your past experience with wear-resistant coatings was not good. Or, maybe you are one of those that have wanted to try coatings but *haven't gotten around to it.* Whatever your situation, Lane Punch wants to help you overcome your wear problems!
Lane has worked with wear-resistant coatings for many years. We feel that the majority of stampers can benefit from wear resistant coatings. Production runs and tool-life can be greatly increased!

You Can Increase Punch Life & Production!

Yes, there is additional cost, but ***you get much more for your money***, especially if your dies are Engineered to allow wear resistant coatings to help you achieve the ultimate in production runs. Don't count your dies out!

We Welcome The Opportunity To Discuss Your Wear Problems.
To gain your confidence in the *benefits of coatings*, we'll need to discuss one of your applications with you. Call any of the numbers listed below.

Your Business Is Appreciated At Lane Punch!
Contact your local Lane Punch Distributor or any Lane Punch plant.



1. Penetration of the coating *downward into the die button's P&W* is proportionate to the size of the hole. Guideline is 1 to 1.5 times the P or W dimension, whichever is smaller.

2. Outside diameter "D" and internal dimensions "P & W" are automatically engineered by Lane Punch to accomodate coating build-up to meet customer specified dimensions and tolerances.

Die Button Ordering Example:
(6) PBPO 32-35 M2 P16.4 W6.4 K2 GP

Recommended Gold Point™ Applications:

Join many satisfied users that have tried Lane Gold Point successfully in heavy wear-type applications such as:

• **Light-gauge perforating punches & forming punches.** In any application where material is flowing over the punch surface, the coefficient of friction is reduced, thus wear is reduced.

• **Pilots.** One of the most overlooked applications. When a pilot wears and looses its size due to drag on the flank of the pilot diameter, registration is lost on the finished stamping! Pilots should be coated to minimize wear and to assure longer, more accurate positioning, longer production runs.

• **Combinations.** Perf. and form punches, staking punches, and/or cold heading punches.

• **Tough 1:1 ratio of point diameter to material thickness situations** or heavy gauge, fine flow applications.

• **Severe stripping problems of non-ferrous materials:** Gold Pointing helps reduce surface galling during entry and withdrawal.

• **Pre-painted stock** (especially white) and **high-silicone content** materials.

• Troublesome abrasive **galvanized materials**.

• **Glass epoxy** with interrupted and continuous fibres and other abrasive material applications.

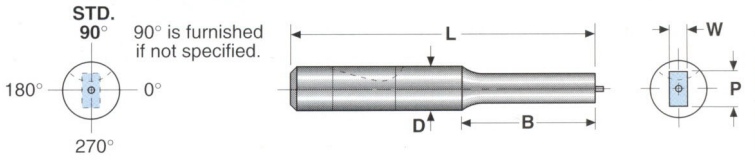
Quality & Cost Advantages

Logical Numbering System™

Saves Time • Easy To Learn • Reduces Errors.

The only fully logical catalog numbering system in the punch industry.

BEHS 13-19-80 M2 P8.0 W8.0 BS 90°



Ball-Lock Punch Heavy-Duty Square/Rect.™

Rap-i-Die Retainers (Multi-Hole)

Largest Variety of Multi-Hole Punch, Die or Wire-EDM Plates
Allows skilled die makers to build *more* dies in *less* time. Or your highly-skilled die makers can build and try out form stations while Lane is building your cut sections. *Completed Dies are Invoiced Dies!*



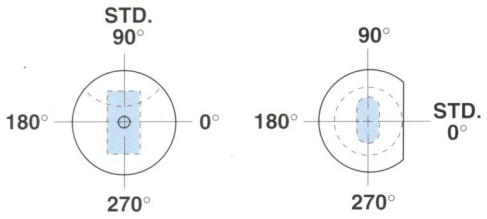
TRU-LOCK®

For Fast, Accurate Mounting:
CNC or Manual
In-Line Dowel
An industry Ball-Lock standard.

For Headed Punches & Die Buttons:
Standard off-the-shelf retainers.
Engineering changes made easy!

Use with the Most Complete Line of Urethane Strippers Available!

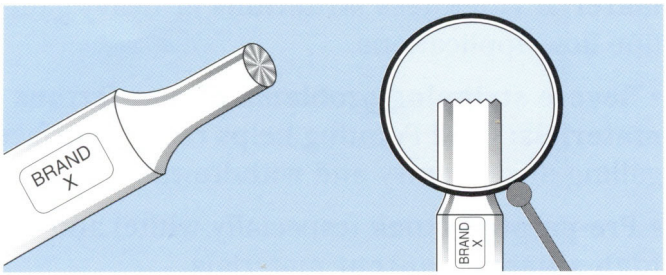


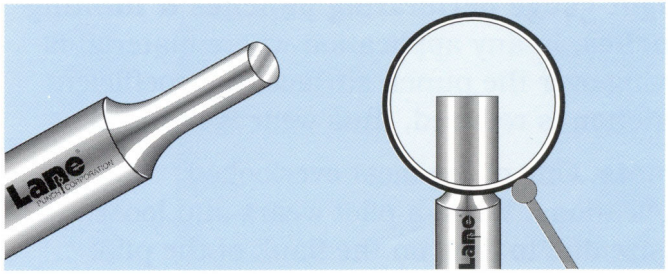


Lane In-Die-Position Orientation

When ordering shaped punches or die buttons, all catalog items specify *in-die position*. This assures proper alignment of key locking devices. In the past, this was one of the leading causes of errors in ordering die components.

Punch Point Tips: Too Often Overlooked





The flat on the very end of every punch, regardless of it's shape, is probably the most critical of punch surfaces.

Always examine the ends of new punches. If they are turned to size or coarse ground, the number of stress risers are many, each a possible fracture point.

You wouldn't tolerate other surfaces to be coarsely ground! Why would anyone accept anything less on the end where the punch first contacts the stock?

It's not surprising that some punches chip or crack a short time after insertion, while others fracture now, break later.

If you've experienced this problem, you'll be pleased to know that Lane Punch does *what good die builders do.* We end-grind to a 0.6 μmR_a finish the ends of all punches to remove any nicks, dings and stress risers prior to shipping it to you.

When Lane ships your punch — it's ready to go into your die and into production!

© 1995 Lane Punch Corporation. All rights reserved.



*Lane is **Quality Certified** with the Automotive Industry Worldwide.*

Lane's Mission

Lane Punch Corporation will develop, manufacture and market high quality products and services while being competitive world-wide.

Through a team approach to managing and continuous improvement at all levels of our manufacturing and marketing organization, our efforts will be focused on satisfying the customer at all times.

Our long-term growth and stability will be based on our technical expertise and marketing capability. We will strive to be the industry leader in product excellence and customer service and to achieve better than average return on investment which will ensure our survival as an effective organization.

JIT Shipping

Our Just-In-Time Shipment Policy on catalog items assists our Customers in meeting their scheduling requirements. This policy is just-as-important to Lane Punch as the quality of our products and services.

Contact Lane Customer Service or our Sales Engineers for further information. We also welcome customers to visit our facilities to discuss our capabilities in quality and service.

ISTA

INDUSTRIAL DISTRIBUTORS

NTMA PRECISION

PMA PRECISION METALFORMING ASSOCIATION

NATIONAL ASSOCIATION OF PUNCH MANUFACTURERS

ISO ADVISOR

© 1995 Lane Punch Corporation. All rights reserved.

Tolerances & Metric-Inch Conversions

METRIC TOLERANCES

Dia.	g5 Slip-Fit Ball-Lock Punches & Buttons	m4 Peerless Press-Fit Punches & Buttons (headed)	m5 General Press-Fit Punches & Buttons (headed)	n4 Peerless Press-Fit Buttons (headless)	n5 General Press-Fit Buttons (headless)	H6 Slip-Fit Retainer Holes	H7 Slip-Fit Dowel Holes
4.0	—	+0.004 +0.008	+0.004 +0.009	+0.008 +0.012	—	+0.008 -0.000	—
5.0	—	+0.004 +0.008	+0.004 +0.009	+0.008 +0.012	—	+0.008 -0.000	—
6.0	-0.004 -0.009	+0.004 +0.008	+0.006 +0.012	+0.008 +0.012	—	+0.008 -0.000	+0.012 -0.000
8.0	—	+0.006 +0.010	+0.006 +0.012	+0.010 +0.014	+0.016 +0.010	+0.009 -0.000	+0.015 -0.000
10.0	-0.005 -0.011	+0.006 +0.010	+0.006 +0.012	+0.010 +0.014	+0.016 +0.010	+0.009 -0.000	+0.015 -0.000
13.0	-0.006 -0.014	+0.007 +0.012	+0.007 +0.015	+0.012 +0.017	+0.020 +0.012	+0.011 -0.000	+0.018 -0.000
16.0	-0.006 -0.014	+0.007 +0.012	+0.007 +0.015	+0.012 +0.017	+0.020 +0.012	+0.011 -0.000	—
20.0	-0.007 -0.016	+0.008 +0.014	+0.008 +0.017	+0.015 +0.021	+0.024 +0.015	+0.013 -0.000	—
25.0	-0.007 -0.016	+0.008 +0.014	+0.008 +0.017	+0.015 +0.021	+0.024 +0.015	+0.013 -0.000	—
32.0	-0.009 -0.020	+0.009 +0.016	+0.009 +0.020	+0.017 +0.024	+0.028 +0.017	+0.016 -0.000	—
38.0	-0.009 -0.020	+0.009 +0.016	+0.009 +0.020	+0.017 +0.024	+0.028 +0.017	+0.016 -0.000	—
40.0	-0.009 -0.020	+0.009 +0.016	+0.009 +0.020	+0.017 +0.024	+0.028 +0.017	+0.016 -0.000	—
45.0	-0.009 -0.020	+0.009 +0.016	+0.009 +0.020	+0.017 +0.024	+0.028 +0.017	+0.016 -0.000	—
50.0	-0.009 -0.020	+0.009 +0.016	+0.009 +0.020	+0.017 +0.024	+0.028 +0.017	+0.016 -0.000	—
56.0	-0.010 -0.023	+0.011 +0.019	+0.011 +0.024	+0.020 +0.028	+0.033 +0.020	+0.019 -0.000	—
63.0	-0.010 -0.023	+0.011 +0.019	+0.011 +0.024	+0.020 +0.028	+0.033 +0.020	+0.019 -0.000	—
71.0	-0.010 -0.023	+0.011 +0.019	+0.011 +0.024	+0.020 +0.028	+0.033 +0.020	+0.019 -0.000	—
76.0	-0.010 -0.023	+0.011 +0.019	+0.011 +0.024	+0.020 +0.028	+0.033 +0.020	+0.019 -0.000	—
85.0	-0.010 -0.023	+0.013 +0.023	+0.013 +0.028	+0.023 +0.033	+0.038 +0.023	+0.022 -0.000	—
90.0	-0.010 -0.023	+0.013 +0.023	+0.013 +0.028	+0.023 +0.033	+0.038 +0.023	+0.022 -0.000	—
100.0	-0.010 -0.023	+0.013 +0.023	+0.013 +0.028	+0.023 +0.033	+0.038 +0.023	+0.022 -0.000	—

METRIC TO INCH CONVERSION

mm	Inch	mm	Inch
1	.0394	51	2.0079
2	.0787	52	2.0472
3	.1181	53	2.0866
4	.1575	54	2.1260
5	.1969	55	2.1654
6	.2362	56	2.2047
7	.2756	57	2.2441
8	.3150	58	2.2835
9	.3543	59	2.3228
10	**.3937**	**60**	**2.3622**
11	.4331	61	2.4016
12	.4724	62	2.4410
13	.5118	63	2.4803
14	.5512	64	2.5197
15	.5906	65	2.5591
16	.6299	66	2.5984
17	.6693	67	2.6378
18	.7087	68	2.6772
19	.7480	69	2.7165
20	**.7874**	**70**	**2.7559**
21	.8268	71	2.7953
22	.8661	72	2.8347
23	.9055	73	2.8740
24	.9449	74	2.9134
25	.9843	75	2.9528
26	1.0236	76	2.9921
27	1.0630	77	3.0315
28	1.1024	78	3.0709
29	1.1417	79	3.1102
30	**1.1811**	**80**	**3.1496**
31	1.2205	81	3.1890
32	1.2598	82	3.2284
33	1.2992	83	3.2677
34	1.3386	84	3.3071
35	1.3780	85	3.3465
36	1.4173	86	3.3858
37	1.4567	87	3.4252
38	1.4961	88	3.4646
39	1.5354	89	3.5039
40	**1.5748**	**90**	**3.5433**
41	1.6142	91	3.5827
42	1.6535	92	3.6221
43	1.6929	93	3.6614
44	1.7323	94	3.7008
45	1.7717	95	3.7402
46	1.8110	96	3.7795
47	1.8504	97	3.8189
48	1.8898	98	3.8583
49	1.9291	99	3.8976
50	**1.9685**	**100**	**3.9370**

PRODUCTS GUARANTEE

(a) Catalog Products: All materials and machining operations performed are guaranteed to be as published in said catalog.

(b) Special Products: All materials and machining operations performed are guaranteed to be as specified per customer's blueprint furnished with the order. Customers are asked to include latest blueprint revision number in the body of the purchase order.

CONFIRMING ORDERS:

(a) Catalog Products: Lane Punch Corporation's policy on telephoned orders by customers for catalog products is that the order is verbally confirmed "as read back" to the customer by the Lane Customer Service Representative. Most catalog products are already shipped before receipt of a mailed confirming order.

(b) Special Products: Promptly-mailed confirming orders do catch up to work-in-process on specials. Customers are asked specifically to include latest blueprint revision letters and/or numbers in the typed body as a condition of purchase order. Please help us help you.

OVERSHIPMENTS:

Because of normal manufacturing risks due to part complexity, it is often necessary to manufacture a larger quantity of parts than the order calls for. Any extras are shipped and billed with the order. Anticipated maximum shipments of parts would be as follows:

CATALOG PRODUCTS	ORDER QUANTITY	MAXIMUM POSSIBLE
Rounds	20 or more	+10%
Oblongs & Rectangles	10 or more	+10%
Classified Shapes	10 or more	+10%
SPECIAL PER PRINT ITEMS	10 or more	+10%

NOTE: In the event overshipment is ***not*** desired, please add a notation **"DO NOT OVERSHIP"** in your quote request.

RETURNS:

(a) Catalog Products: Because most catalog products are custom-ground to customer-specified sizes, returns are limited to a 15% courtesy credit.

(b) Special Per Print Items: Specials are not returnable.

METHOD OF SHIPMENT:

Lane Punch Corporation ships UPS unless otherwise specified by the customer.

CANCELLATIONS:

If labor and material have already been applied, there will be a cancellation charge. Partially-finished parts will be shipped if requested by the customer at the time of cancellation. Shipping costs will be added.

PRICING:

See current Lane Punch Corporation Price Supplement.

TERMS:

1% 10-Net 30 days, 1.5% Monthly Late Payment Charge, F.O.B. Shipping Point.

REJECTION PROCEDURE:

Our ever-improving Statistical Process Controls have minimized errors from the time of system implementation. However, as humans, we sometimes do err. Most importantly, we want to correct the mistake as quickly as possible and get the corrected parts back in your plant. Here's how:

1. Phone your distributor to pick up the rejected part(s) *or*
2. Ship the rejected part(s) back to the plant from which you received them.
3. **(a)** Include a copy of your purchase order or our packing slip, plus a short note describing the rejection and your specific needs, including replacement.
   (b) Give us the name, title and phone number of the proper person we should contact upon receipt of the part(s).

Upon receipt of the rejected part(s), Lane will:

A. Re-inspect the part(s),
B. Verify the mistake,
C. Contact the distributor or customer to advise of the scheduled shipment date of reworked or replacement part(s),
D. Issue appropriate credit for rejected part(s) *and*
E. Re-invoice for the reworked or replacement part(s).

Adjustments after our inspection are limited to repair or replacement of the product or crediting the original price. Any claims must be initiated within 90 days of product shipment.

REWORK BY CUSTOMER:

Lane Punch Corporation reserves the right to inspect, rework or replace all products manufactured. Each of our personnel are held accountable for quality as well as customer satisfaction of the operations they perform. We want them to be aware. Credits for rework by the customer are not authorized.

REPLACEMENT PRIOR TO RETURN:

Sometimes the production requirements of a customer require a replacement order be started before return of the questionable rejected part(s). Lane Punch Corporation will cooperate fully to initiate a second order. However, in the event the returned part(s) can be reworked or are already as specified, customer will be invoiced for both orders.

Lane PUNCH CORPORATION

Plant Locations

DETROIT

Lane Punch Corporation
4985 Belleville Road
Canton, MI 48187 USA
Telephone: 313-397-3200
FAX: 800-253-6731
FAX: 313-397-9317

CHARLOTTE

Lane Punch Corporation
281 Lane Parkway
Salisbury, NC 28146 USA
Telephone: 704-633-3900
FAX: 800-227-6725
FAX: 704-633-2488

MILWAUKEE

Lane Punch Corporation
2450 South 162nd Street
New Berlin, WI 53151 USA
Telephone: 414-784-4910
FAX: 414-784-6295

تامین کننده قطعات استاندارد قالب

www.avrinco.com info@avrinco.com

۰۹۱۲۸۴۷۶۵۹۶ ۰۹۱۲۳۸۵۱۰۴۴ تجهیز قالب اورین

instagram: @avrinco_ تلفن: ۰۲۱-۴۴۱۳۳۱۵۱



عاملیت فروش قطعات استاندارد در ایران

AZOL-GAS CODIPRO PUNCH INDUSTRY CO., LTD. Lane PUNCH CORPORTION ORSA BKM BURSA KALIP MERKEZİ